FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 293. (No. 37, Vol. VI.)] SEPTEMBER 11, 1914. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 3d. Post Free, 3½d.

Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.

Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom ... 15s. 0d. Abroad ... ... 20s. 0d.

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EDITORIAL COMMENT.

The Vulnerability of Aircraft.

One of the principal questions that soldiers have been asking ever since it became recognised that aircraft must have their place in the organisation of armies is the one of whether such craft, aeroplanes or dirigibles, could carry out the work of scouting when exposed to the fire of hostile troops. The question will be answered in grim earnest during the present war, as will many others that have been the subject of academic discussion in peace time. Indeed, it has been answered already, though up to now we have not been allowed to know the full terms of the reply.

So far as we have information to guide us, the answer appears to be so much in the affirmative that we are given to believe that if an aeroplane is flying at the maximum height at which useful observation can be carried out, viz. at somewhere in the neighbourhood of 3,000 ft., it is at least an even money chance that the aviator and his machine will not be hit severely enough to bring them down. Indeed, if he be under rifle fire alone, the odds in his favour would seem to be much better than even money.

Where he is exposed to gun-fire the risk seems to be much greater, since in most of the cases recorded of aeroplanes being brought down it has been stated that gun-fire was responsible. This is to be expected, and for a reason which appears in a Reuter telegram published in the London newspapers on Tuesday last. According to this report, Flying-Lieutenant Roeckel of the French army, accompanied by Captain Simon as observer, had an extraordinary escape from death when out on an air reconnaissance.

When 6,000 ft. above Musson Wood, seven miles north-west of Longwy, they encountered a well-directed fire from battery-guns against aeroplanes, which were guarding a dirigible anchored near Haloney.

One shot produced an air depression which destroyed the aeroplane's balance. The motor stopped, and the machine fell rapidly, but the pilot managed to check its fall at about 200 metres from the ground and landed 300 metres north-west of Longwy in front of the French firing line, which was falling back under a murderous German artillery and rifle fire.

The pilot rapidly examined his machine under a hail of shots, restarted his motor, and flew away, landing one hour afterwards at his starting-point safe and sound.

From this account of the experience of these two officers, from which they were certainly very fortunate to emerge with their lives, the danger from artillery fire is not so much that of a direct hit as from the air disturbance caused by a bursting shell. The difficulties of ranging on a comparatively small, fast moving object like an aeroplane flying at three or more thousand feet above the ground are tremendous and make a direct hit a matter of pure luck. Certain it is that if the aeroplane is to perform its hazardous mission in safety it requires rather more than the average luck of the game to attend it! It is beyond doubt a vulnerable instrument of war, save and except that it operates in a medium which supplies no solid data to the gunner to enable him to fix distances and speed, which are factors which go far to compensate for its vulnerability and to make its work in war possible of safe, or reasonably safe, accomplishment.

Taking all things into account, and particularly the reports that have come in about aeroplanes being riddled by rifle bullets and yet coming safely home, it would seem that the chief danger to be apprehended by the scouting airman is this disturbance area resulting from the blast of exploding shells, and it seems safe to presume that as a result of the operations against aircraft during the war, the artillerists will turn their attention to the evolution of an anti-aircraft gun which will fire a shell carrying a very heavy bursting charge of a high explosive capable of causing the maximum air disturbance over a very large area. In other words, it would almost seem

that attack with common shell with a time fuse is more likely to succeed against aircraft than shrapnel, since the disturbance caused by the former is undoubtedly greater.

So far as concerns airships, there is so little information available that no real line can be taken regarding them. We read that several Zeppelins have been fired at and brought down, but we do not know exactly how they met their end. Obviously, airships by reason of their greater size are better targets for gun-fire than the small, swift aeroplane, and it should therefore be possible to attack them by more direct methods. But of that we shall be better able to form an opinion when we know more of how things have been going.

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Light at last.

In dealing with the work of aircraft during the war we have, up to the present, preferred to err on the side of caution rather than to accept as authoritative the statements made by correspondents who have only been able to gain their news at third or fourth hand, or the impressions of solitary soldiers which, as we pointed out last week, are among the very vaguest of all impressions when they are gained under fire; therefore, our attitude with regard to the lessons to be derived from the use of aeroplanes in modern warlike operations has been non-committal, and we have preferred the policy of "wait and see" rather than one of dashing off into irresponsible and unconsidered opinions which the light of subsequent official news might very well have shown to be based on entirely false premisses. Our caution has, it seems, created some little misunderstanding, since Mr. Harold Perrin, the Secretary of the R.Ae.C., has drawn our attention to the possibility that our comments of last week might be taken to be in discount of the value of aircraft to the army in the field. We need hardly say that nothing is, or was, farther from our thoughts, for, as the records of FLIGHT are there to show, we have always been profoundly impressed with the enormously important part aircraft must play in civilised warfare.

So far as concerns this present war, we have published in full practically every item of intelligence which has been printed with regard to the use of aircraft, though, as we have already pointed out, we preferred to wait until official and dependable information came through before committing ourselves to really definite pronouncements.

Now, however, matters bear a different aspect, for we have the despatch of Sir John French to the Secretary of State for War, and published on Thursday this week, to help us to understand how the aircraft have been used and what really magnificent work has been done by the officers of that splendid body the Royal Flying Corps. Sir John's despatch is dated the 7th inst., so that it brings our knowledge of things very closely up to date. Naturally, in dealing with major operations of war on such a scale as is covered by the despatch, it is not possible for the Commander-in-Chief to go closely into the details of the services performed by individuals or even the smaller units, and we are thus left to deduce a great deal from the terse, plain records of Sir John's general statement. Probably we shall not know all that our Army in France owes to the self-sacrifice and efficiency of the R.F.C. until the detailed Staff records of the operations are available.

The first mention of the aerial service is contained in a paragraph relating to the position at Mons on the 23rd August. Sir John French says of this:—

"From information I received from French Headquarters I understood that little more than one, or at most two, of the enemy's army corps, with perhaps one cavalry division, were in front of my position; and I was aware of no attempted outflanking movement by the enemy. I was confirmed in this opinion by the fact that my patrols encountered no undue opposition in their reconnoitring operations. The observation of my aeroplanes seemed also to bear out this estimate."

Evidently, the British Commander had already been making extended use of aerial patrols. Incidentally, and to show how absolutely justified was our refusal to base any judgment on the fragmentary and unreliable unofficial reports which have hitherto been all we have had to go upon, we remarked last week that if the stories of men returned from the battle line were to be trusted—*which we expressly doubted*—our aeroplanes were conspicuous mainly for their absence from the area of the operations!

Later on the same day the aeroplanes did excellent work in discovering the real strength of the German attack, for Sir John remarks:—

"When the news of the retirement of the French and the heavy German threatening on my front reached me, I endeavoured to confirm it by aeroplane reconnaissance; and as a result of this I determined to effect a retirement to the Maubeuge position at daybreak on the 24th."

From thence onwards to the end of the period covered by the despatch, nothing transpires as to the work of the R.F.C., though we may be sure that officers and men were doing all that was required of them. Of the work Sir John French speaks in these ringing words:—

"I wish particularly to bring to your Lordship's notice the admirable work done by the Royal Flying Corps under Sir David Henderson. Their skill, energy, and perseverance have been beyond all praise. They have furnished me with the most complete and accurate information, which has been of incalculable value in the conduct of the operations. Fired at constantly both by friend and foe, and not hesitating to fly in every kind of weather, they have remained undaunted throughout.

"Further, by actually fighting in the air, they have succeeded in destroying five of the enemy's machines."

Thus the youngest branch of the Service has, on the first occasion of its being employed, engraved its name and deeds deeply on the roll of the imperishable fame of the British Army, and has shown that no matter whether it be by earth, sea or sky, our officers and men are—what we have always believed them to be.

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Airship's Day and Night Cruises for the Protection of London.

THE Secretary to the Admiralty announces that it has been decided that one of the British naval airships shall make short cruises over London during the next few days by day and by night.

There is no necessity for the public to be alarmed at the sight of the airship, and on no account should any attempt be made to fire at it.

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Illuminated Piers and Esplanades. Warning to Municipalities.

THE Secretary of the Admiralty communicates the following statement for publication:—

For the general safety of the community, the country being at war, municipal authorities are requested to reduce as much as possible the number of powerful electric lights on piers, esplanades, and public places which are visible from seaward or from the air.

FLIGHT

THE "ROUND BRITAIN" MACHINES.

THE machine numbered 6 in the Circuit of Britain, and which was to have been piloted by Capt E. C. Bass, is

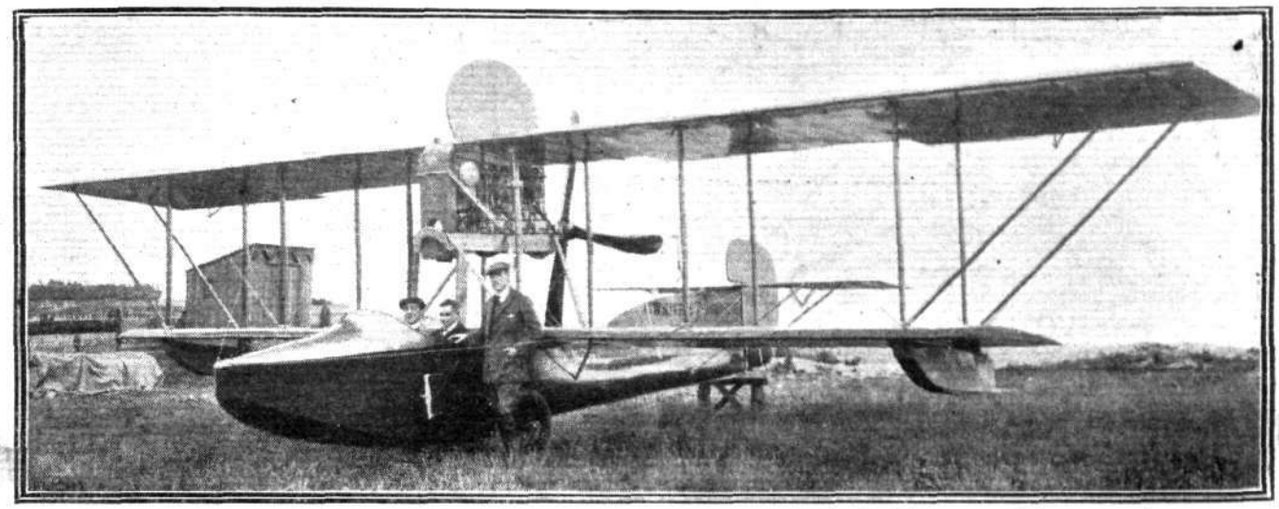
The White and Thompson Curtiss Flying Boat.

This machine, although following standard Curtiss practice in its general lay out, differs in numerous details from the American-built Curtiss boats. One of the innovations incorporated, which is apt to be overlooked by the casual observer, but which is nevertheless of the greatest importance, is the new wing section. Instead of the usual Curtiss section, one like the R.A.F. 6 has been chosen, and appears to have several advantages over the original Curtiss. The wings are rectangular, as seen in plan, and the top plane is of considerably greater span than the lower one, the weight of the extensions being taken, when the machine is at rest, by steel tubes sloping downwards and inwards to the lower extremities of the outer inter-plane struts. Interconnected balancing flaps are hinged to the rear spar of the upper plane, and not, as in the original Curtiss machines, to the plane struts.

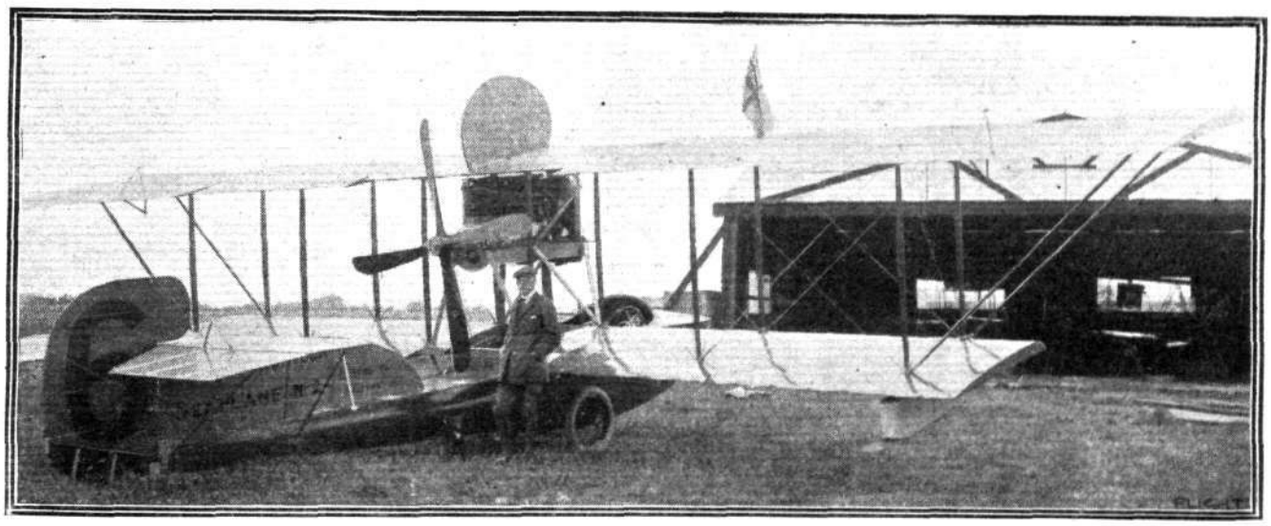
A vertical fin is fitted above the upper main plane in order, no doubt, to counteract the comparatively large side area of the boat. Six pairs of spruce struts separate the main planes, the whole wing structure being made rigid by diagonal cross bracing.

Mounted on strong ash bearers resting on a structure of steel tubes sloping upwards from the lower main spars is the engine—a 120 h.p. Beardmore A.D.—which drives a four-bladed propeller situated behind the planes, the trailing edge of which has been cut away in the centre to provide the necessary clearance. The main petrol tank is placed inside the boat, whence petrol is pumped by means of a pressure pump to a smaller service tank mounted on the bearers in front of the engine. The capacity of the petrol tank is 60 gallons, or sufficient for a flight of about six hours' duration.

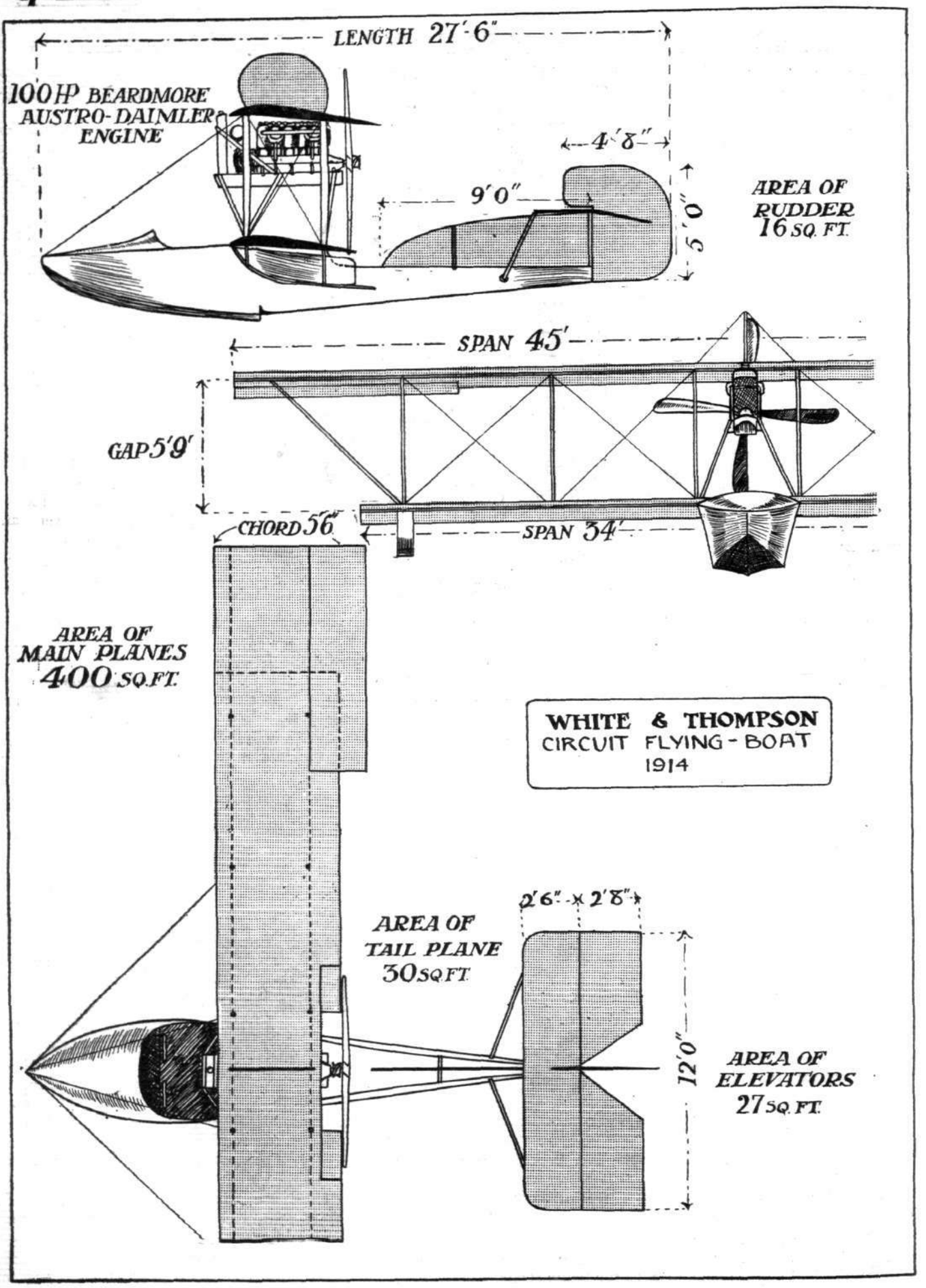
The boat, which has been constructed by Messrs. Saunders of Cowes, is a beautiful piece of work, as is to be expected from a firm of such standing. It is built up of two skins of mahogany, copper sewn, over a framework of ash and spruce. In front the boat is of roomy proportions, and affords ample accommodation for pilot and passenger, who sit side by side inside a very comfortable cockpit. From the nose to the step, which is placed



ROUND BRITAIN MACHINES, No. 6.—Three-quarter front view of the White and Thompson flying boat.



ROUND BRITAIN MACHINES, No. 6.—Three-quarter rear view of the White and Thompson flying boat.

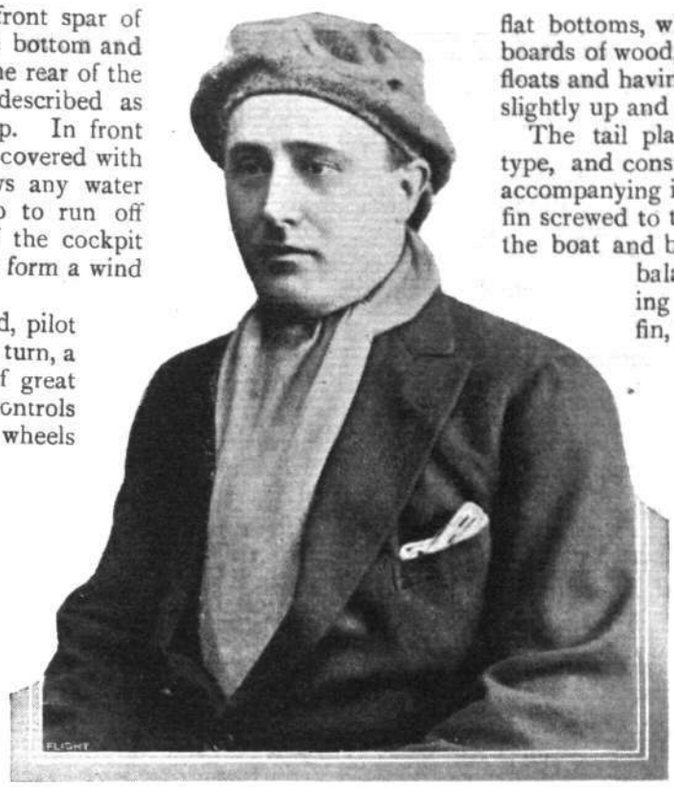


ROUND BRITAIN MACHINES, No. 6.—The White and Thompson (Curtiss) flying boat. Plan, front and side elevations to scale.

a short distance behind the front spar of the wings, the boat has a Vee bottom and outward sloping sides. To the rear of the step the section may be described as being circular with a flat top. In front of the occupants the boat is covered with a curved deck, which allows any water that may wash over the top to run off easily, whilst just in front of the cockpit the deck is swept upwards to form a wind screen.

As dual controls are fitted, pilot and passenger may direct in turn, a feature which should be of great value for long flights. The controls consist of rotatable hand wheels operating the *ailerons* and elevator, and foot bars for the rudder. A transverse rocking shaft runs across the boat and projects on each side, where it carries the crank levers whence cables are taken to the elevator.

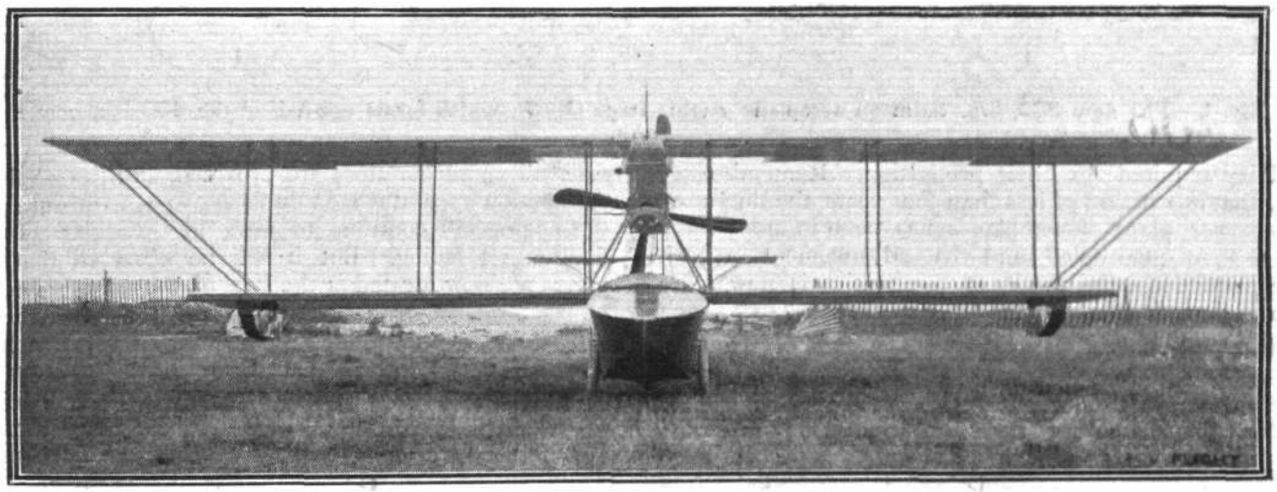
Mounted under the lower wing tips, to which they are attached by steel clips, are two metal floats of rectangular section and having flat bottoms, which are protected by spring boards of wood, screwed to the front of the floats and having their rear ends free to move slightly up and down.



Captain E. C. Bass, who was nominated as pilot for the White and Thompson flying boat.

The tail planes are of the usual Curtiss type, and consist, as will be seen from the accompanying illustrations, of a large vertical fin screwed to the top of the rear portion of the boat and braced by steel tubes, a partly balanced rudder, a fixed stabilizing plane mounted on top of the fin, and a divided elevator. The lower portion of the rudder is covered with metal and serves as a water rudder when taxying.

The weight of the machine empty is 1,600 lbs., and with full load, including pilot, passenger, and six hours' fuel, the weight is 2,400 lbs., giving a loading of 6 lbs. per sq. ft. The actual speed is not known, but judging from previous Curtiss boats and making allowance for the higher horse-power and new wing section, it is probably about 70 m.p.h.



ROUND BRITAIN MACHINES, No. 6.—Front view of the White and Thompson (Curtiss Pat.) flying boat.

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Mr. Gustav Hamel's Death Presumed.

APPLICATION was made by Mr. T. Bucknill on the 9th inst., before Mr. Registrar Hardy, to presume the death of Mr. Gustav W. Hamel. Formal evidence as to the last known movements of Mr. Hamel was given, and an order was made by the Registrar to presume the death.

German Aircraft Factory Moved.

A SIGNIFICANT report from Berlin is to the effect that the aeroplane factory at Muelhausen, with a normal capacity of three machines a fortnight, has been moved to a site on the other side of the Rhine.

More German Aircraft.

IT is stated in a Berlin message received by the *Times* from Amsterdam, that from statements made by members of the Reichstag it is believed that the German Government intend building six airship divisions, in addition to torpedo and other craft, as rapidly as possible.

London and the Coast Air Defence.

A NOTICE appeared in the *Daily Mail* of last Saturday, as from official quarters, stating that in connection with the aerial defence of England, and of London particularly, which is in the hands of our Navy, waterplanes are continually patrolling the East Coast on the lookout for hostile aircraft, searchlights being employed at night. Guns for defence against aircraft have been for some days erected on the roofs of Government buildings and other places that might be the special objects of attack, and a reserve of aeroplanes is near at hand to attack at once any hostile aircraft.

Weight of Zeppelin Bombs.

ONE of the Zeppelin bombs dropped on Antwerp is stated to have weighed 460 lbs.

THE 600 H.P. SALMSON AEROPLANE ENGINE.

AN ENGINE FOR THE AEROPLANE OF THE NEAR FUTURE.

THERE are few people who take a real live interest in aviation who have not at some time or other endeavoured to mentally depict the aeroplane of the future. But whatever room there may be for speculation as to the lines upon which aeroplane design will progress, and the size which will be ultimately attained, there cannot be any doubt that large and proportionately powerful engines

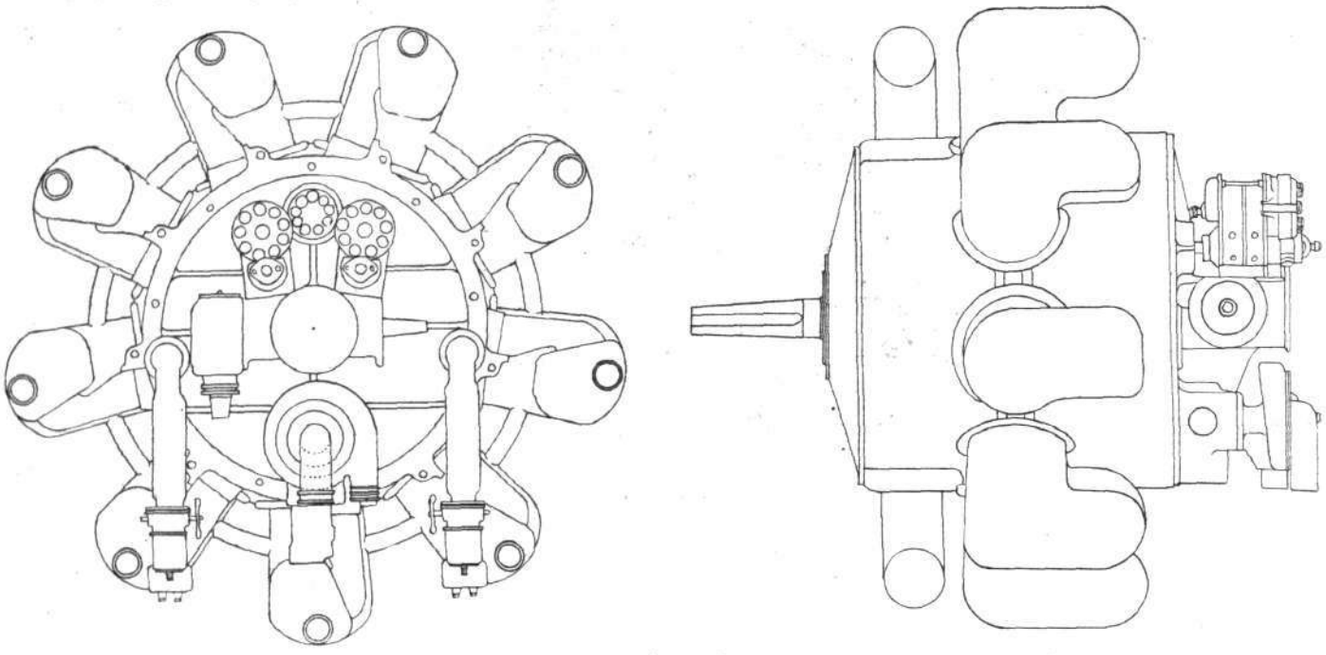

Fig. 1.—The new 300 h.p. Salmson aeroplane engine (type OD 9), which forms one-half of the 600 h.p. power unit.

will be required for their propulsion. Remembering, too, that in a period of less than four years the output of the power plant of aeroplanes has been in many cases more than quadrupled, and that advancement in both the practice and the theory of aeronautics is now more rapid than formerly, it is equally certain that such engines will be necessary in the not far distant future.

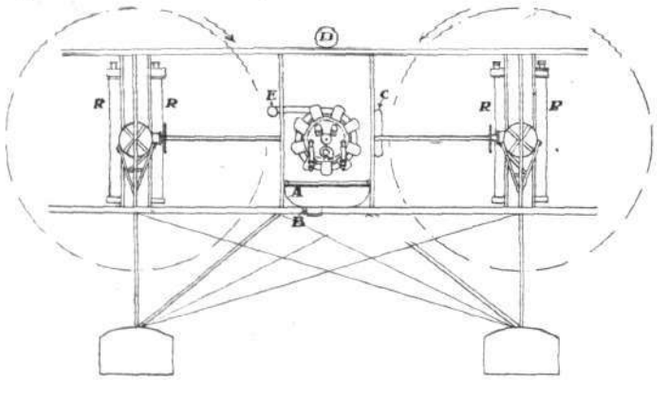

Fig. 2.—An elevation of the 600 h.p. Dudbridge Ironworks-Salmson power unit. A—Main petrol tank; B—Petrol pump to engine supply tank; C—Oil reservoir; D—Engine petrol tank; E—Silencer; R—Radiator.

Hence, it is probable that the latest production of the Dudbridge Ironworks, Ltd.—the 600 h.p. power unit—will attract very keen interest. From the accompanying illustrations it will be seen that it consists of two 9-cylinder Salmson engines of 300 h.p., bolted at the ends of a gear-box, G. The engines, which are water-cooled, although of a new type, differ little in their design from the usual Salmson practice, so far as their arrangement, internal construction, and the materials employed are concerned; ball-bearings are fitted throughout, the connecting rods are attached to the crank-pin by a special planetary gear, as in previous models, and the gas is taken through a mixing chamber on the end of the crank-case. Two carburettors are provided, and the whole of the ignition apparatus is in duplicate so as to ensure that the engine will continue to work in the event of one ignition set failing. But it will be observed that the valves are now located at the side of the engine instead of, as formerly, in the head of the cylinder; while the special springs that were used for closing the valves have been replaced by others of the more conventional form.

The proposed arrangement for driving the propellers is shown in Figs. 2 and 3. The drive is taken through the gear-box, by two cross-shafts to the propeller-shafts

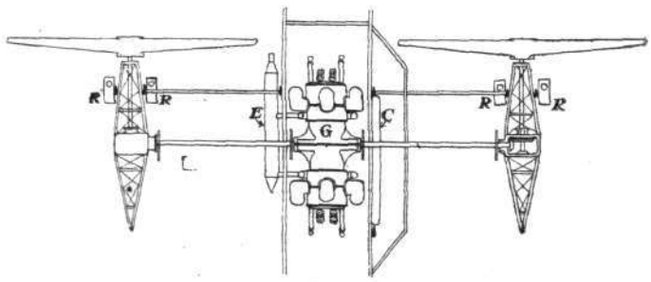

Fig. 3.—A plan of the 600 h.p. Dudbridge Ironworks-Salmson power unit, showing the arrangement of the transmission and the special *nacelles* for carrying the propellers. C—Oil reservoir; E—Silencer; G—Gearbox; R—Radiators.

and propellers. Both ends of each cross-shaft are provided with special elastic couplings, so as to permit of free relative movement of the engine and propeller *nacelle* due to the flexure of the aeroplane, as well as to compensate for any slight disalignment of the shafting

when fitting in place. Details of the internal construction of the gear-box are not yet available, but by means of clutches and gearing it is so arranged as to render it possible for either engine to drive either or both propellers. The advantages to be derived from such an arrangement will be readily appreciated. In the event of the failure of one engine from any cause, the working motor does not drive that which is broken down, and repairs can, therefore, be executed to the latter during flight. Difficulties in starting are, also, to a large extent eliminated, since where a self-starter is fitted the pilot can start his engine without rotating the propellers, and the engine can jog round until he is ready to commence his flight. Furthermore, it is possible to obtain a far greater range of power by disconnecting one motor from the propellers, and a much more favourable fuel consumption than when a single engine is fitted, while the air resistance is considerably reduced.

The normal speed of the engines is from 1,200 to 1,250 revs. per min., and the gearing inside the gear-box raises the revolutions of the cross-shafts to about 1,800 revs. per min., but a bevel reduction gear supported in the two *nacelles* which carry the propellers reduces the revolutions of the latter to about 900 per minute. These speeds are, however, capable of being varied to suit the wishes of individual constructors. The *nacelles* are carried on the inter-plane struts, and are designed to carry the torsional loads produced in the transmission and by the propeller.

The radiators for the engines are arranged on both sides of each propeller *nacelle* in two elements per motor, and from their position in front of the screws (the machine illustrated is of the propeller type) receive the maximum cooling effect from the air even whilst the aeroplane is at rest upon the ground or on the water.

The common exhaust silencer and the oil reservoir are fitted one on each side of the body of the aeroplane, and are thus also adequately cooled—a desirable feature where long-distance flights are projected. The oil reservoir is of large capacity, and is connected to both engines by flexible metallic tubing. There are two petrol tanks, one of which, the main reservoir, with a capacity of 70 litres, is fitted underneath the engines; while the other, the supply tank, is arranged above the top planes and is supplied from the main tank by pumps in duplicate driven by vertical geared shafts, which are brought down from the engines.

The arrangement and details of the design show that the utmost care has been taken to provide a power unit capable of developing the maximum amount of power while occupying the minimum of space and offering extremely low air resistance; and the Dudbridge Ironworks are to be congratulated upon the result which they have achieved. We hope to hear that the unit has been installed upon an aeroplane at an early date, for, from the success which has attended the Salmson engines in the past, we anticipate an equally satisfactory performance from this, the latest type.

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THE ROYAL FLYING CORPS.

THE following appointments were announced in the *London Gazette* of September 1st:—

R.F.C.—Military Wing.—Lieut. George B. Stopford, R.A., from the Reserve, to be a Flight Commander, to be seconded, and to be granted the temporary rank of Captain whilst so employed. August 8th.

Royal Naval Air Service.—Walter Edward Birch has been entered as Flight Sub-Lieut., for temporary service, and appointed to the "Pembroke," additional, for Calshot Naval Air Station. August 31st.

Probationary Flight Sub-Lieut. B. C. Meats to the "Pembroke," additional, for course of instruction at the Central Flying School. August 29th.

The Admiralty announced on the 6th inst., that the undermentioned gentleman had been granted a temporary commission in the Royal Naval Volunteer Reserve as follows:—

Lieut. E. M. Speakman to the "Pembroke," additional, for special duties in connection with the Naval Air Service.

The following appointments were announced in the *London Gazette* of the 4th inst.:—

Temporary appointment made at the War Office—To be a Dep. Ass. Director, August 5th, 1914: Capt. (temp. Major) H. Musgrave, R.E., Squadron Commander, Military Wing, Royal Flying Corps.

R.F.C.—Military Wing.—Archibald G. Weir to be Second-Lieut. (on probation). September 5th.

Royal Naval Air Service.—The following was announced by the Admiralty on the 7th inst.:—Probationary Flight Sub-Lieut. E. R. Whitehouse has been confirmed in the rank of Flight Sub-Lieutenant, and appointed to the "Pembroke," additional, for the Isle of Grain Naval Air Station. August 27th.

The following appointment was announced in the *London Gazette* of the 8th inst.:—

R.F.C.—Military Wing.—Second-Lieut. Samuel P. Cockerell, Special Reserve, to be a Flying Officer. August 28th.

The following appointment was announced by the Admiralty on the 8th inst.:—

The Rev. P. M. Cavrois-O'Caffrey has been granted a temporary commission as Lieut. Royal Naval Volunteer Reserve, and appointed to the "Pembroke," additional, for special duty in connection with the Royal Naval Air Service. September 7th.

The following appointments were announced in the *London Gazette* on the 9th inst.:—

R.F.C.—Military Wing.—The following Second Lieutenants to be Lieutenants:—Thomas O'B. Hubbard, Geoffrey de Havilland. August 5th.

Military Wing.—Lieut. T. O'B. Hubbard, Special Reserve, is advanced from Flying Officer to Flight Commander, with the temporary rank of Captain, on appointment to the Central Flying School as an Instructor. August 5th.

The following appointments were announced by the Admiralty on the 9th inst.:—

Royal Naval Air Service.—Messrs. B. Hart, J. Groves, and B. Ffield, all appointed Probationary Flight Sub-Lieutenants and appointed to the "Pembroke," additional, for course of instruction at Hendon, to date September 7th.

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A Duel in the Air.

AN exciting aeroplane duel is reported from the front by the Reuters Petrograd correspondent. After performing some successful reconnaissances, the aviator, Capt. Nesteroff, seeing an Austrian aeroplane hovering over the Russian forces, at once set out to attack it, in order to prevent it from dropping bombs. Capt. Nesteroff, at the peril of his life, charged straight at the enemy's aeroplane, which was destroyed by the impact, both aviators being killed.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING.

A Special Meeting of The Committee was held on Tuesday, September 8th, 1914, when there were present:—Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. F. K. McClean, and the Secretary.

New Members.—The following new members were elected:—Richard P. V. Creagh, Reginald Lord, Flight Sub-Lieut. W. Hayland Wilson, R.N.A.S.

Aviators' Certificates.

THE following Aviators' Certificates were granted:—

887 Lieut. Edgar Ramsey Ludlow-Hewitt (Royal Irish Rifles), (Maurice Farman Biplane, Upavon). Aug. 19 h, 1914.

888 Felix Ruffi (Wright Biplane, Beatty School, Hendon). Aug. 29th, 1914.
(Subject to permission of Aero-Club de France.)

889 Elmer Peter Roberts (Henry Farman type Biplane, Pashley School, Shoreham). Aug. 29th, 1914.

890 Andrew Y. K. R. Cheung (Chinese Subject), (Wright Biplane, Beatty School, Hendon). Aug. 31st, 1914.

891 Capt. Oliver Nash Moriarty (Antrim R.G.A., S.R.), (Maurice Farman Biplane, Netheravon). Sept. 2nd, 1914.

892 Capt. Andrew Adolphus Walser (London Regt.), (Maurice Farman Biplane, Netheravon). Sept. 2nd, 1914.

893 Lieut. Jocelyn Morton Lucas (4th Royal Warwickshire Regt.), (Maurice Farman Biplane, Netheravon). Sept. 3rd, 1914.

894 Lieut. William Adam Sedgwick Rough (Maurice Farman Biplane, Netheravon). Sept. 3rd, 1914.

895 Capt. Cecil Harry Wolff (Bedfordshire Regt.), (Maurice Farman Biplane, Netheravon). Sept. 4th, 1914.

896 Second-Lieut. John Reginald Howett, R.F.C. (Grahame-White Biplane, Grahame-White School, Hendon). Sept. 8th, 1914.

The following Aviators' Certificates, granted during vacation, were confirmed:—

	Cert. No.
Aikman, 2nd Lt. Derick Robertson, R.F.C. (S.R.) ...	885
Arcier, Francis Alec	856
Arnold, Flight Sub-Lt. Anthony Rex, R.N.A.S. ...	876
Barry, Lieut. Charles Carleton (3rd Leinster Regt.) ...	886
Coles, Lieut. Edgar Ralph	858
Collins, Lionel Seymour	869
Courtney, Francis Thomas	874
Crick, Albert Throne	859
Douglas, Flight Sub-Lt. Norman Sholto, R.N.A.S. ...	867
Gamwell, Frederick Whittington	868
Graves, Lieut. Evelyn Paget, R.F.A.	870
Hardstaff, Richard Cecil	880
Heathcote, Capt. John Robert Campbell (Q.O. Cameron Highlanders) ... ...French	1711
James, Sergt. Frank, R.F.C.	864
Jean, Engine Room Artificer John Watson, R.N. ...	878
Judge, Air Mechanic Victor Clarence, R.F.C. ...	855
Kinnear, Lieut. John Lawson (The King's Regt.) ...	884
Lawrence, Lieut. George Aubrey Kennedy, R.F.A.	857
McGrane, Flight Sergt. Hugh, R.F.C.	861
Maude, Flight Sub-Lt. James Douglas, R.N. ...	879
May, Sergt. Alfred Robert	863
Mortimer-Phelan, William	866
Murray, Petchell Burtt (Hydro-aeroplane)	881
Nickerson, Sub-Lt. Arthur Lorne, R.N.	877
Palmer, Eric Barton	872
Pitt, George Llewellyn	871
Purnell, William Orchard Usher	882
Sanders, Lieut. James Donald Gerhardt, R.F.A. ...	860
Smith, Charles M. ... ...French	1700
Thomson, Gordon Lindsay	873
Unwin, Sergt.-Major Frederick Henry	862
Upton, Master Mariner Richard	883
Weir, Graham	865
Wilson, Flight Sub-Lt. William Hayland, R.N.A.S.	875

Age Limit for Aviators' Certificates.—It was decided that until further notice the age limit for Aviators' Certificates be reduced from 18 years to 17 years.

Gordon-Bennett Aviation Cup, 1914.—Letter was received from the Fédération Aéronautique Internationale, stating that on account of the European War, it was impossible for the Aero Club de France to organise the Race at Buc this year, as previously arranged, and asking whether the Royal Aero Club would undertake the organisation of the Race in England. It was decided to reply that the Royal Aero Club could not organise the Race, and is strongly of opinion that it should not be held.

British Empire Michelin Cup No. 2, £800.—On account of the War, it was decided to postpone this Competition for the year 1914.

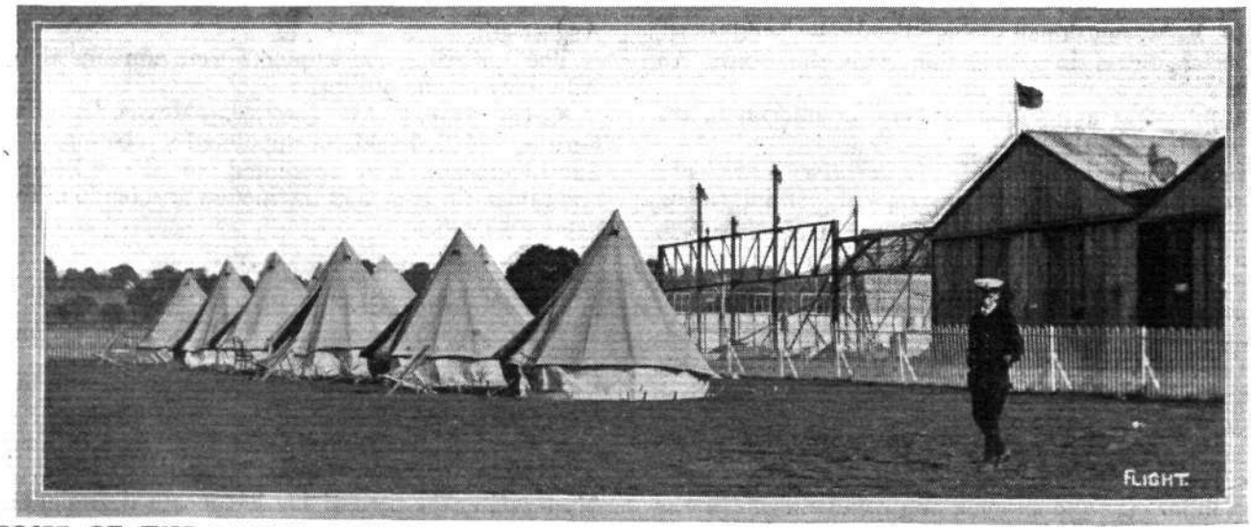
Royal Aero Club Burgee.

The Royal Aero Club has received a letter from the Rt. Hon. R. M'Kenna, P.C., M.P., the Home Secretary, stating that His Majesty The King has graciously approved the design for the burgee of the Royal Aero Club. The approved design is the Royal Crown with the caduceus.

Rifle Club at Eastchurch.—A Rifle Club has been formed at Eastchurch and the necessary ground placed at the disposal of the Club by Lieut.-Col. Sir George Holford, K.C.V.O.

Sergt. W. J. Knight, the groundman at Eastchurch, has been appointed one of the instructors and the Royal Aero Club has made a donation of £10 towards the purchase of ammunition.

166, Piccadilly, W. HAROLD E. PERRIN, Secretary.



SOME OF THE TENTS OF THE R.N.A.S. AT HENDON AERODROME.—Note the searchlight on the roof of the hangars.

FLIGHT

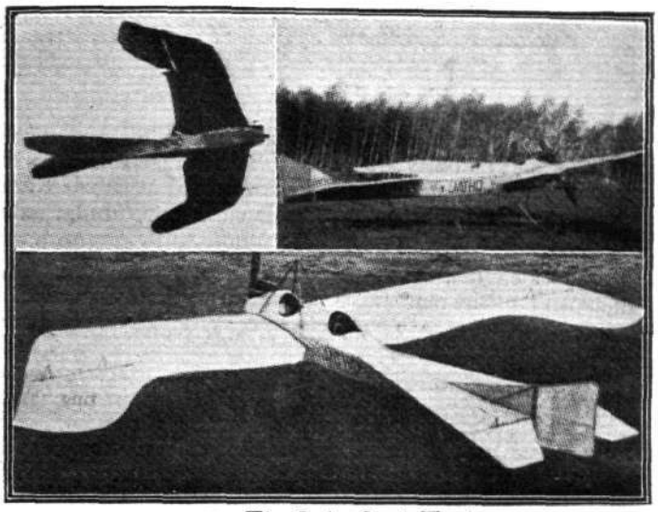
AIRCRAFT "MADE IN GERMANY"

WHICH MAY BE EMPLOYED AGAINST THE ALLIES.

(*Continued from page* 924.)

21. The Jatho Steel Taube.

THIS monoplane is, as the name implies, built throughout of steel; even the wing ribs are made of this material. The *fuselage* is nearly rectangular in section, the bottom being only slightly narrower than the top. It is constructed of steel tubes autogeneous welded. In front the *longerons* converge to form a very good entry for the air. Enclosed in this part of the body is the crank-case of the engine—a 100 h.p. Mercedes; whilst the cylinders project through the aluminium covering. Pilot's and passenger's seats are placed well down inside very roomy cockpits, where the occupants are protected against the wind. In front of the pilot is a dashboard with a very complete set of instruments, including barograph, tachometer, map case, watch, inclinometer, compass, &c. The petrol and oil tanks, which are placed low down in the *fuselage*, contain a supply sufficient for a flight of 7 hours' duration. As the speed of the machine is about 78 m.p.h. it has a radius of action of something like 273 miles.



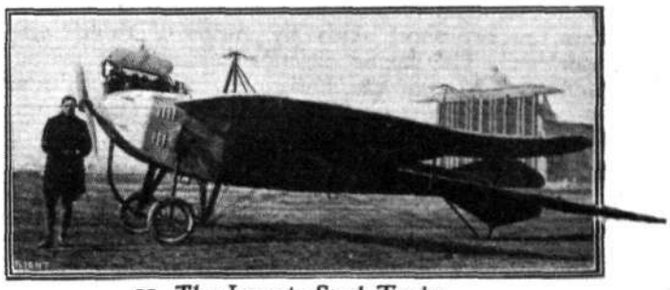
21. The Jatho Steel Taube.

The wings are of the usual Zanonia form generally employed in monoplanes of the Taube type. The spars are made of steel tubes, and the ribs, as we have already mentioned, are also of steel. On each side of the *fuselage* part of the wings have been left uncovered in order to provide a better view in a downward direction.

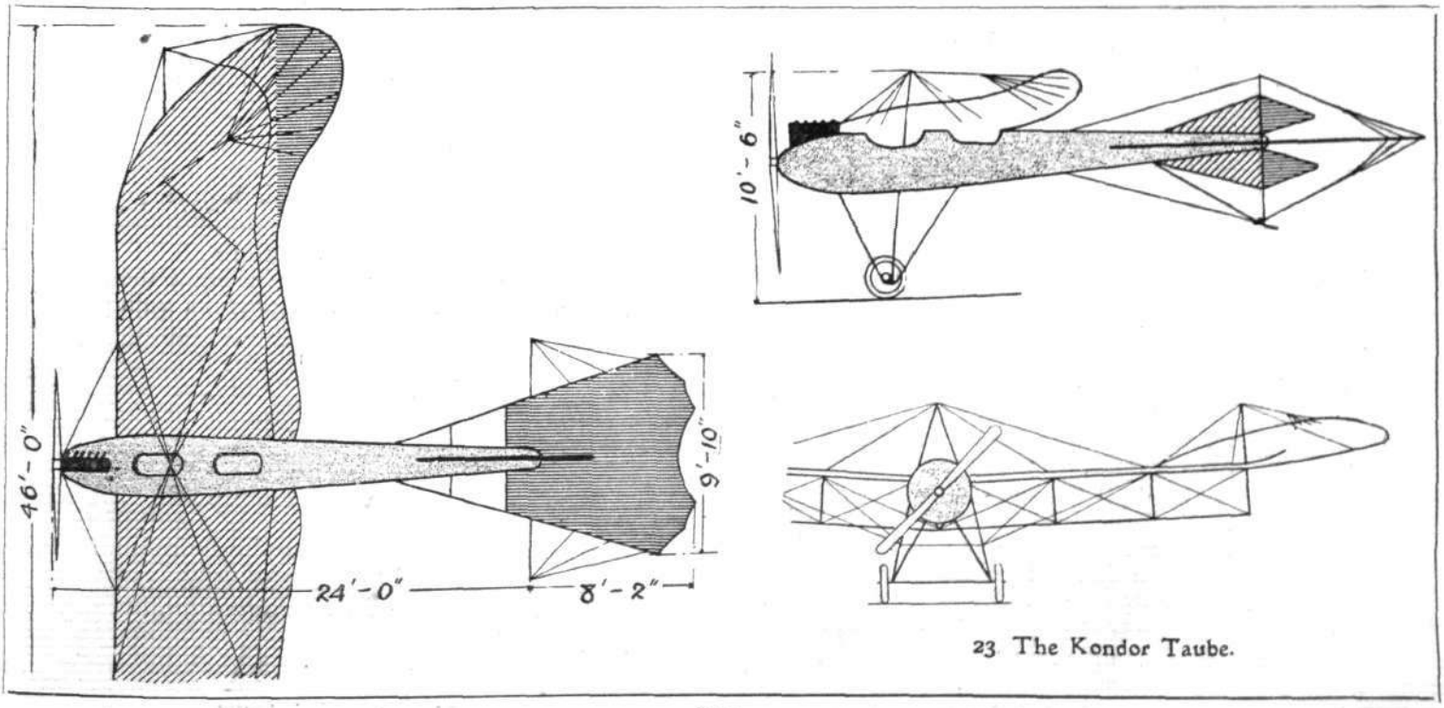
The constructors of the Jatho steel Taube also build a racing type monoplane with a 150 h.p. engine, and a light sporting monoplane fitted with a Gnome motor.

22. The Jeannin Steel Taube

is another all-steel machine. In wing form it differs but little from other monoplanes of its type, except that the girder under the wings has been in the latest models replaced by cable bracing. The passenger is situated immediately behind the engine, whilst just behind him is the pilot's seat. The engine—a 100 h.p. Mercedes—is mounted in the nose of the *fuselage*, and carries above it a radiator similar to that on the Albatros biplane. The chassis is of a very simple type, and consists of a short skid, carried on four streamline steel tube struts, and to it is hinged the divided axle, which is sprung by means of telescopic tubes running to the *fuselage* at the attachment to which are incorporated rubber shock absorbers.



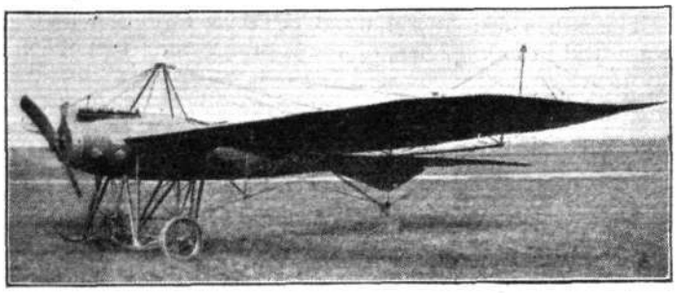
22. The Jeannin Steel Taube.



23 The Kondor Taube.

23. The Kondor Taube

resembles other monoplanes of this type in the shape of its wings and their bracing, but an attempt has been made to provide a better streamline *fuselage*. This member in the Kondor Taube is of circular section, with openings cut out of the top for the engine, passenger and pilot.



23. The Kondor Taube.

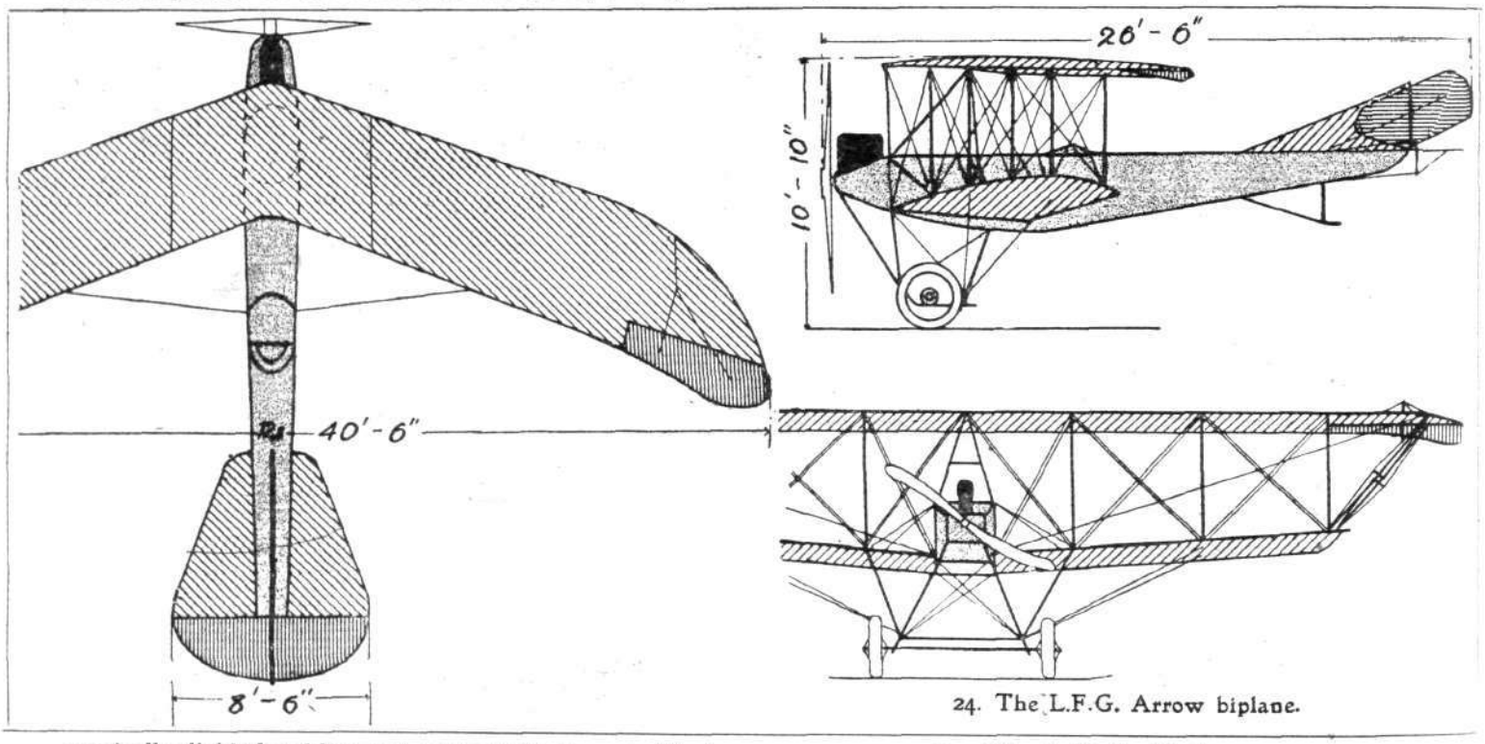
The chassis is somewhat similar to that of the early Blackburn monoplane, and although appearing to be particularly strong would seem to offer a considerable amount of head resistance. The tubular axle is slung from the two short skids by means of rubber shock-absorbers. The flexing elevator forms a continuation of the fixed portion of the horizontal tail plane, and symmetrically divided rudders and vertical tail fins are fitted above and below the tail plane. Evidently the reduction of head resistance obtained by the circular *fuselage* is more than counteracted by the complicated chassis and wing bracing, for the speed of the machine with 100 h.p. Mercedes engine is only just over 60 miles per hour.

24. The L.F.G. Arrow Biplane

has, as its name implies, wings of the back-swept type. The slope backwards of the wings of this machine is very pronounced. Whilst the upper main plane is straight as viewed from in front, the lower one is set at a very pronounced dihedral angle. The machine possesses a large amount of automatic stability laterally, and *ailerons* are fitted to the tips of the upper plane. At the rear of the rectangular section *fuselage* are carried the tail planes, which consist of a stabilising plane, to the trailing edge of which is hinged an undivided elevator, and of a balanced rudder mounted wholly on top of the tail plane. A skid formed by three steel tubes protects the tail planes against contact with the ground. Pilot's and passenger's seats are arranged tandem fashion, but very far apart, the passenger being placed immediately behind the engine,

24. The L.F.G. Arrow biplane.

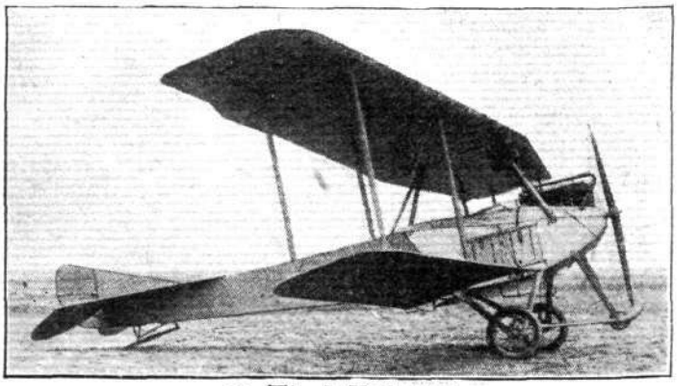
whilst the pilot's seat is situated well behind the main plane, about half-way along the *fuselage*. The chassis is built throughout of steel tubes bent round at the bottom to form short skids, from which is slung the tubular axle by means of rubber shock-absorbers. With a 100 h.p.. Mercedes engine, or an Argus motor of the same power, the speed of the machine is 60 miles per hour.



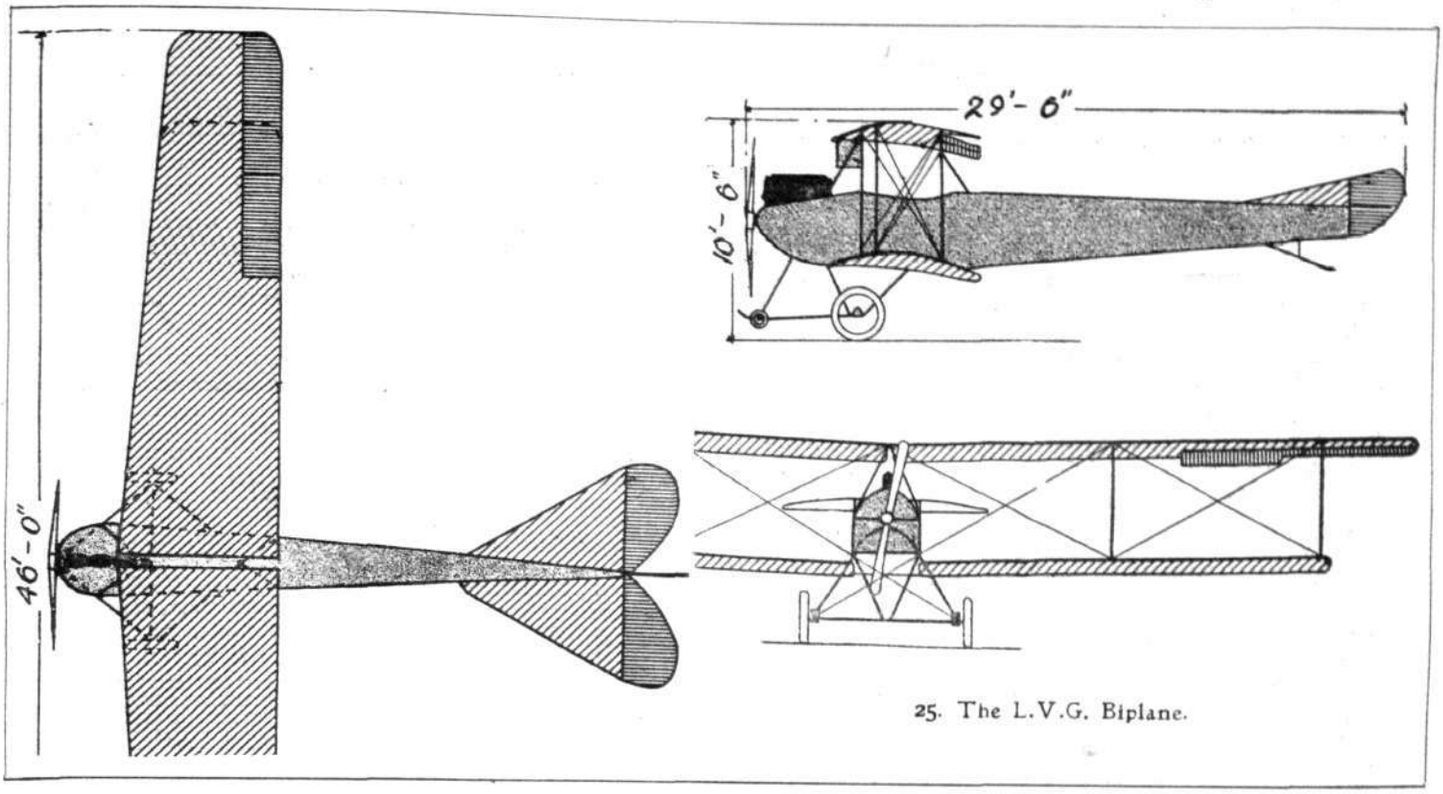
24. The L.F.G. Arrow biplane.

25. The L.V.G. Biplane

cannot, strictly speaking, be said to belong to the Arrow type, since, although the leading edge of its main planes



25. The L.V.G. biplane.



25. The L.V.G. Biplane.

slopes backwards, its trailing edge is straight as seen in plan. Both upper and lower main planes are set at a dihedral angle, and *ailerons* are fitted to the tips of the upper plane. The *fuselage* is of rectangular section, and resembles greatly that of the Albatros biplane. Pilot's and passenger's seats are placed close together, tandem fashion, the passenger sitting immediately behind the engine. The main weight is taken when the machine is on the ground by two wheels slung from the angle between two pairs of tubular chassis struts by means of rubber shock-absorbers. A short skid runs from the wheel axle to a point in front of the propeller, and two steel tubes running from the lower *longerons* of the *fuselage* immediately underneath the engine support the skid. A small wheel is incorporated in the angle between the two front chassis struts, and serves to prevent the machine from turning over on her nose in case of a bad landing. This front portion of the chassis is chiefly used for school purposes, and may be removed in order to slightly increase the speed of the machine.

26. The New Type L.V.G. Biplane.

This machine differs, apart from dimensions, in minor details only from the one numbered 25. It is of slightly larger span, and head resistance has been reduced in various places, with the result that it is slightly faster than the older type. The engine fitted is a 100 h.p. Mercedes.

26. The new type L.V.G. biplane.

It is worthy of note that the L.V.G. firm is one of the most important constructors of German military machines.

(*To be continued.*)

⊛ ⊛

British Michelin Cup No. 2.

ON account of the War the Royal Aero Club announces that this competition is postponed for this year.

Gordon-Bennett Aviation Cup.

OWING to the war the French Aero Club will be unable to organise this race, announced to be held at Buc this year. The Royal Aero Club have decided, in response to the suggestion of the French Club that they should undertake its organisation in England, that they are unable to do so, and, moreover, the committee is strongly of opinion that it should not be held in 1914 at all.

⊛ ⊛

The Late Capt. Bertram Dickson.

LAST week the will of the late Capt. Bertram Dickson, who died recently intestate, was proved at £6,535.

Pilots' Age Limit now 17.

THE Royal Aero Club has decided to reduce until further notice the age-limit for aviators' certificates from 18 years to 17 years.

No Field Glasses.

THE use of telescopes or field glasses by civilians is prohibited, by order of the Fortress Commander of the Thames and Medway Defences, in the Sheerness (Isle of Sheppey) and Isle of Grain areas.

AIRCRAFT AND THE WAR.

REPORTS more or less authentic and detailed information relating to the work accomplished by the aircraft engaged in the war are gradually becoming fuller, although they still deal mainly with bomb-dropping operations, and little is still actually known of the service which has been performed by the Allies' pilots in the class of work for which aeroplanes are especially fitted—namely, reconnaissance, and the observation of gunfire.

The German aeroplanes, which had been flying over Paris daily since the 30th ult., made their last appearance on Wednesday, the 2nd inst., when two of them flew over the city. Both were fired at immediately they appeared by guards posted on the roofs of houses, but no damage was done, and the machines were able to make their way, one towards the north-east and the other towards the east. The former, however, when passing over Fort de Romainville was attacked by rifle fire from two French aeroplanes, which took up their positions one on each side, for about ten minutes, during which time the German was continually ascending, and owing to the superior climbing powers of his machine he was able to get safely away. The other pilot was not so successful, as in flying over Fort de Champigny, he was brought down in a manner very graphically described by Mr. A. G. Hales in the *Evening News* of the 3rd inst.:—

"It was five-and-twenty minutes past five in the evening when a sudden sound brought me to my feet wide awake and watchful . . .

"'What is it?' I snapped the question at my son, who was on the war path with me. The reply came crisp and sharp—'An aeroplane travelling like the devil. Looks like a German, and I'll bet she's after the big mob of cattle stored yesterday in the fields for the Army.' . . . .

"Suddenly she dipped her nose earthward and came sweeping down, plunging through space as a hawk 'stooping' on its prey. . . . . The next moment the ship veered in her downward swoop and skimmed the earth as a swallow skims in full flight. It was superb airmanship, and, foe though I knew the man at the wheel to be, I could not help admiring his splendid nerve, for at the low altitude he was now sailing at any marksman amongst the heavy foliage could have brought him down with a shot-gun.

"There were two of them in the craft. . . .

"They must have known their ground well, or they would never have dared to skim the tree tops as they were doing. . . .

"They saw something from their vantage ground which we could not see or hear, for as suddenly as the machine had dipped towards earth it rose again. . . . Again it dipped earthward, but further away from our hiding-place.

"I knew the sentries must have seen the invader by this time, but no rifle spoke.

"Out of the fields to the right rose a French aeroplane; she rose like a bird on the wing, climbing up and up, but always well from under the invader.

"A shot through body or brain, or a plunge down to annihilation? Whichever it was the man at the driving gear showed neither fear nor hesitation; he took the only course open to him.

"Up he climbed, his plane pointing almost vertically towards the clouds. It was his only chance—to get above his foes one at a time and drop bombs on them, or else to dive straight down on one and bring it to earth—and death—with him.

"The Frenchmen knew as well as the invader. They raced him skyward, always keeping from under, yet closing in on either flank like a pair of eagles hunting down an osprey. . . . They drew closer and ever closer.

"The man on the left reached out an arm and fired at the man at the German's driving gear. Did he hit or miss? We could not tell.

"We saw the German make a sudden headlong dive, and even as he shot downwards he veered in his flight and passed under the left-hand foe and skimmed away like a wild goose going down the wind in a gale. It was a splendid piece of manœuvring, for it took him from between his foes.

"The right-hand Frenchman struck across his path at right-angles, and to do so he had to swoop down and lose the advantage of the upper air. The German had to turn, and the changed course drove him in the direction of the fort whose existence he must have known as well as his pursuers.

"To attempt to pass that fort at the altitude he was travelling at meant being riddled by lead, for well he knew the red caps would be watching the fight and flight, rifle in hand, in their hundreds. No hope lay that way, and the game was up; but the German was game.

"Give the devil his due, he was game to the marrow. Only men brave to the verge of madness take on such tasks as he had taken, but his sands were running out.

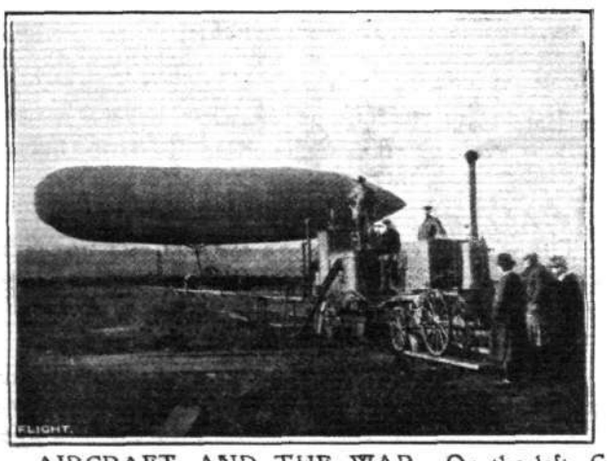
"But his moment was not yet. He turned and twisted, dived low, rose high, darted to right and left, charged forward, wheeled, and tried to drive his machine through that of a foe.

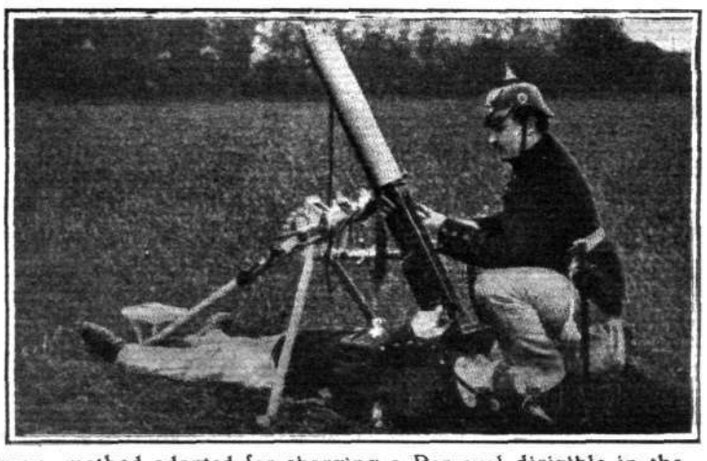
"His skill was superlative, his nerve unbreakable. We lost sight of them all behind a clump of foliage, and then two vessels came into view, and both were craft of France.

"The German lay a broken mass of splinters on the ground, and amid the wreckage lay two dead men who, whatever their faults may have been, had known how to die like men, if they had lived like buccaneers of the trackless blue."

A *communique* issued on September 3rd, which stated that "the measures taken for chasing German aeroplanes with heavily-armed French machines flying over Paris have prevented the Germans from flying over the city again to-day," forms a fitting commentary upon the incidents above referred to. During that day a German aeroplane was brought down at Vincennes by two French aeroplanes, the pilots of which, it is stated, sent charges of grapeshot into the wings.

On the 2nd inst., a German aeroplane dropped a number of bombs on Belfort, but no damage was done, although the noise from the explosions was deafening,





AIRCRAFT AND THE WAR.—On the left, German method adopted for charging a Parseval dirigible in the open. On the right the German Dreyse gun for use against aircraft.

and in order to escape the fire from French forts, the pilot flew over Swiss neutral territory.

The *Daily Mirror* of the 4th inst. described an incident which it is alleged took place on one of the British naval airships when returning from a reconnaissance. A propeller had broken, and, owing to contrary winds, the airship commenced to drift towards German territory. Seeing that the only hope was to fit a new propeller, an engine-room artificer crawled along the 2½ in. iron bracket and performed the operation at a distance of about 15 ft. from the gondola while the airship was at a height of 2,500 ft. The statement is hardly surprising that he has been recommended for promotion!

A thrilling incident was related to Queen Alexandra last week by a sapper in the Royal Engineers who was wounded and is now at the London Hospital. The *Daily Telegraph* gives his story as follows:—

"Following a very hard fight on the day before, he was lying on the ground with his regiment resting. Suddenly a German aeroplane hove in sight. It flew right over the British troops, and commenced to signal their position to the German camp.

"A minute later, amid intense excitement of the troops, two aeroplanes, with English and French pilots, rose into the air from the British rear. Ascending with great rapidity, they made for the German aeroplane, with the intention of attacking it.

"At first some of our men, who were very much on the alert, fired by mistake at the French aeroplane. Luckily their shots went wide.

"Then the troops lay still, and with breathless interest watched the attempts of the French and British aviators to outmanœuvre their opponent, and to cut off his retreat. After a little time the Franco-British airmen abandoned this attempt, and then the Englishman and the German began to fly upwards, in the evident desire to obtain a more favourable position for shooting down from above. Owing to the protection afforded by the machine, it would have been of little use for one aviator to fire at his opponent from below. Once a higher altitude was attained the opportunity for effective aim would be much greater.

"Up and up circled the two airmen, till their machines could barely be distinguished from the ground. They were almost out of sight, when the soldiers saw the British aviator was above his opponent. Then the faint sound of a shot came down from the sky, and instantly the German aeroplane began to descend, volplaning in graceful fashion. Apparently it was under the most perfect control. On reaching the earth the machine landed with no great shock, ran a short distance along the ground, and then stopped.

"Rushing to the spot, the British soldiers found, to their amazement, that the pilot was dead. So fortunate had been the aim of the Englishman that he had shot the German through the head. In his dying moments the latter had started to descend, and when he reached the earth his hands still firmly gripped the controls.

"The aeroplane was absolutely undamaged, and was appropriated by the British aviators."

On September 4th, a submarine arrived at Harwich with a German naval lieutenant and a mechanic on board. It appears that when cruising about 30 miles from Borkum, a seaplane was sighted floating on the water with a damaged engine. After rescuing the men the machine was sunk; and it was stated in the *Daily Telegraph* that the seaplane had been scouting for British warships previous to the failure of the engine and that the men had endeavoured to effect repairs during the 20 hours they had been in their predicament. It is suggested in *Reynolds' Newspaper* that the incident occurred on August 28th and that the seaplane formed part of the aeroplane flotilla covering the operations of the portion of the German Fleet which destroyed the fifteen British fishing boats.

On the 3rd inst., two Belgian aviators flew over the city of Liège and dropped messages stating that the Allies were being successful in the operations and urging the inhabitants to keep up their courage.

A Zeppelin is reported to have made an attempt to wreck the tunnel near Wetteren in Belgium on the 4th inst., but was unsuccessful, and on the same day a German aeroplane which had been compelled to descend near Ostend owing to engine trouble, was captured and destroyed by a number of peasants.

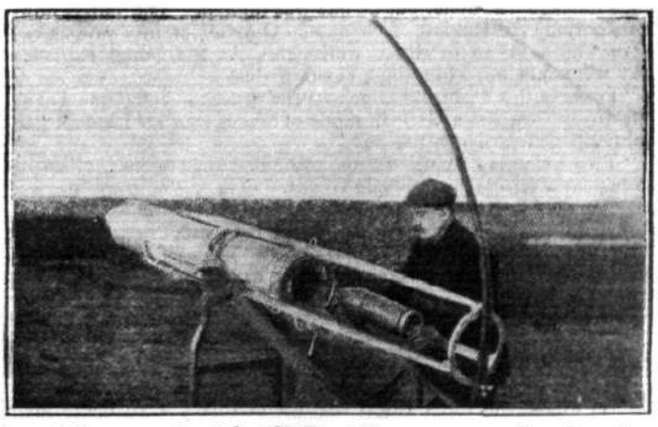
The Petrograd correspondent of the *Chronicle* relates that wounded Russian soldiers returned from the front state that the Zeppelins are useless—three of them having been brought down by the Russians, who used the petrol for their motor cars. The German aeroplanes were, however, most effective, and had rendered great service to the Germans, as they had manœuvred over Russian troops during the fighting and signalled their observations to the artillery commanders, who were thus enabled to direct their fire into the Russian lines.

An official *communique* issued by the Servian authorities at Nish on the 5th inst. stated that an Austrian aeroplane had been destroyed by mitrailleuses between Jania and Lesnitza. The pilot was killed.

Mr. Richard H. Davis is reported to have sent a cable to the *New York Tribune* which throws a lurid light upon the morale of the German troops. He says:—

"When I was a prisoner with them one of their own aeroplanes passed over us. They thought it was an English machine and Count von Schwerin, commanding the 7th Division, and all his staff at the same time began shrieking commands, some to shoot, others not to shoot. They were like men gone suddenly crazy. It was a most pitiable exhibition. Their conduct throughout can be explained in only one way. They are men who know they are in the wrong, that their cause is unlawful, and, like a man who enters a house as a burglar, they do not hesitate at murder."

Captain Voisin is reported to have sent his congratulations to Lieutenant Campagne, of the French Air Service, who, despite the failure of his engine, which had been struck by a bursting shell, managed to glide down from



AIRCRAFT AND THE WAR.—A German 7·5 centimetre aerial gun trained for firing, on a motor truck. On the right, the German 13 centimetre bomb-dropping tube for dirigibles.

a height of about 1,800 metres, and bring back observations, which enabled the position of two batteries of artillery to be located.

The Japanese Embassy in London, on the 7th inst., received a telegram from Tokio stating that the Japanese naval commander reports that two Japanese seaplanes on the 5th inst. reconnoitred Tsingtau and dropped bombs on the railway station and the barracks. One seaplane was struck by a number of shots, but both returned safely.

During the fighting round Termonde, German aeroplanes flew continually over the troops, but at too great a height for the guns of the forts of Puess and Liezele to reach them.

Amongst the spoil taken by the Servians from the Austrians after the battle of Jadar was an aeroplane.

The *Daily Telegraph* of the 6th inst. states that: "John Baker, of the Royal Flying Corps, who is in hospital at Netheravon, tells in a letter to his parents at Boston (Lincs.) of a thrilling experience he had when flying to France as a mechanic with an officer of the R.F.C. He is suffering from a broken leg and other injuries. He says, 'while flying over Boulogne at a height of 3,000 ft., something went wrong with the machine and the engine stopped. The officer said, "Baker, our time has come. Be brave and die like a man. Good-bye," and shook hands with me. I shall always remember the ten minutes that followed. The next I remembered was that I was in a barn. I was removed to Boulogne, and afterwards to Netheravon, being conveyed from Southampton by motor ambulance.'"

A German aeroplane flew over the unfortified town of Ghent on the 5th inst., and dropped two bombs, fortunately without doing any harm, excepting to two private buildings. The *Daily Telegraph* special correspondent, in recording this incident on the 6th inst., relates that—

"During the day I passed through Ghent and found the town seething with excitement and indignation. An hour before two bombs had been dropped into it from German aeroplanes. For this act there is not the slightest excuse or justification. Ghent is a purely industrial city, with no fort or other means of defence, and by all the laws of war is absolutely exempt from attack. But the Germans proved again that they have no regard for either the international rules of warfare or the dictates of humanity.

"Flying at a great height, so that no definite objective was possible, the aeroplanes dropped two bombs on to the quiet, peaceable town. The first fell on the roof of a private house in the Rue de la Beinfaisance. It went through the tiles and fell into a room on the second floor. This was wrecked, but, happily, there was no one in the house at the moment. Every pane of glass in the place was shattered, as also were scores of windows in the adjoining houses and those on the opposite side of the road.

"A factory gable was struck by the second bomb. Here again much damage was done, but no one was injured. The latter, however, only by the luckiest of chances. Only about fifty yards away there was a group of thirty workmen. As the bomb exploded they were enveloped in a thick cloud of dust.

"Possibly this dastardly attack on the peaceable inhabitants of an unfortified town was a German mode of revenge for an incident that had happened earlier in the day.

"Two aviators, flying Taube machines, had come down at Sottegem, a village just outside Ghent. One reason given me was that they had believed themselves to be at Alost, and another that they had been forced to descend from lack of petrol to continue their flight. The latter is the more probable cause, as the German aviators have shown a wonderful knowledge of the country over which they fly, and have never before, so far as can be judged from their swift and unfaltering flights, mistaken their direction.

"However this may be, the two flyers were made prisoners by the gendarmerie and taken in motor cars into Ghent. To this incident the bomb-throwing exploit was the sequel.

"As I close this letter I hear that the Germans have made their fourth attempt to drop bombs on Ghent. Two bombs were dropped, but the damage done appears to be trifling."

Bomb-dropping operations are also stated to have been carried out on the 5th inst. by the Germans at Eccloo (near Bruges), and on the Russian frontier near Zoolen, with, however, but little success, so far as material damage was concerned; while the aeroplane, at the latter town, was fired upon and captured by the Russians.

A report received from Petrograd states that on the 6th inst. the Russians fired on and captured a Zeppelin between Lodz and Kaliseh. The airship had thirty men on board, including two Staff officers and two gunners, while there was also a large quantity of explosives. The Austrians had taken a large number of photographs, and made several drawings. In the same locality an Austrian colonel, who was piloting an aeroplane, was also brought down.

Two bombs were dropped by Austrian aviators on Valievo on the 5th inst., one of which struck the hospital where the Red Cross flag was flying.

An interesting account of the experiences of a German airman during a reconnaissance over the battlefield of Sedan is described in a letter which he wrote to his father, extracts from which were published in the *Daily Mail* of the 7th inst., as coming from German newspapers:—

"On the morning of August 22nd I flew in foggy weather to Sedan with Lieutenant J., a splendid airman. In the Bertrix region we flew into heavy rain clouds and had to descend to 3,000 ft. As we came down we already heard the rattle of the enemy's shrapnel round the machine, and presently a French division came into view beneath us.

"J. was shot through the body. Then the motor stopped and the machine glided down steeply straight at the enemy's troops, which were firing like mad at us. At 2,500 ft. from the ground the machine suddenly reared up, and, turning round, I saw J. lying dead with a bullet hole in his forehead. I promptly leaned over his seat and gripped the steering-wheel, and was able to start our biplane gliding again.

"A wood on the other side of the French was my objective. The minutes in which I soared over the enemy only 600 ft. from the ground seemed centuries to me. A hail of bullets whistled about my ears. Suddenly I received a heavy blow on the forehead and blood rushed into both my eyes. But my will-power conquered. I kept consciousness and thought only of bringing the machine safely to the ground away from the enemy. Then a sudden puff of wind turned the machine over, and as my dead comrade lay over the warping gear I could do nothing else but land in the midst of the enemy.

"In landing the machine turned over and ran into a hedge. I was sent flying. From all sides the 'red trousers' rushed at me, firing still. I drew my pistol and shot down three of them, and then I felt a bayonet at my breast. An officer appeared and shouted, 'Don't kill him. He is a brave soldier.'"

"Doctors on examining the airman found that the bullet had been warded off by his flying helmet. He says the officers treated him very well. A sudden attack by the Germans enabled him to hide under a hedge unobserved, and he finally rejoined the German troops."

In connection with the rumours which have been current since the commencement of the war, to the effect that the number of Zeppelins possessed by Germany are far in excess of that which is generally believed, Mr. C. F. Steward, the *Daily News* correspondent, writing from Rotterdam on the 6th inst., states that—

"German officials seem almost feverishly anxious to be courteous to the Americans, and have even gone so far as to conduct some of them over their airship stations. From these I learn that in addition to the 42 airships already in commission, the Germans are building 100 more.

"When former airships were built, it was usual to make five duplicate parts. These duplicates are now being assembled to make the new fleet of airships."

The *Times* correspondent at Bordeaux, in his despatch dated the 7th inst., tells of the extraordinary escape of

two airmen from death during a reconnaissance. It is related that—

"Details of a brilliant aeroplane action have been received here. Lieut. Roeckel, with Captain Simon as Staff observer, left Marville to reconnoitre the enemy's movements in the neighbourhood of Longwy, Arlon, and Virton. When 1,800 metres above Musson Wood, which is three kilos. north-west of Longwy, an anti-aeroplane battery, guarding a German dirigible, opened fire upon them. A shell burst so near them that the machine was completely thrown off its balance. The motor stopped, and there began a giddy descent which, in spite of the furious efforts of the pilot, was only checked 200 metres from the ground. The pilot was determined rather than fall into the hands of the enemy to dash down amid the flames of Longwy citadel. A descent was finally contrived 300 metres south-west of Longwy, in advance of the French firing-line, which was withdrawing at the moment under heavy rifle and shell fire. Here, after an examination of the motor under a hail of shells and bullets, Lieut. Roeckel explained to the observer officer the method of starting the machine, and a quarter of an hour after both officers had returned to their posts."

It is reported (Reuter's) that Japanese airmen again attacked the forts at Tsingtau by bombs on the 7th inst. and it is interesting to recall that many Japanese pilots received their early training in flying at some of the German aerodromes.

An interesting account is given by Bombardier A. E. Smith, who was wounded by a bomb dropped from a German aeroplane, in a letter dated from Netley Hospital to a friend in Edinburgh which shows that attacks by aerial bombs serve other purposes, such as rangefinding. His letter, which appeared in the *Times* of the 9th inst., reads as follows :—

"Those bombs have proved a great success in the war, as they find the enemy's ranges very accurately. The bomb when dropped leaves a thick, black, smoky line to enable their gunners to take the exact range. We were in a good position, but suffered loss. The enemy could not find us until the aeroplane came on the scene. Then we had it rather hot. The gunners had to leave the guns, but later saved them all after being reinforced by other guns."

The change of front made by the Germans, in moving towards the east of Paris on the 4th and 5th inst., was discovered in time by air scouts. The *Daily Telegraph* in its issue for the 8th inst. stated—

"The beginning of the alteration of German plans was noticeable at Creil. Hidden by a thick screen of troops from the army in the field, but observed by aerial squadrons, the enemy was seen to be on the move. . . . Only the commandants in the field can say whether the movement was expected, but it is the fact that immediately the enemy began their strategical movement, British and French dispositions were changed."

It is reported by Reuter from Rome that two Voisin seaplanes from the French Fleet had been scouting in the vicinity of Antivari on the 8th inst., and that an Austrian aeroplane fitted with a gun had attacked one of these machines, but without success.

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EDDIES.

QUITE a number of visitors gathered at Hendon last Saturday, and although there is plenty of flying it is hardly of such a sensational character as of old, but is still well worth watching. Most of the afternoon's entertainment was provided by Mr. Birchenough, who was testing a new M. Farman. Had we not known who was at the lever, we should have come to the conclusion that Verrier was back again, so adept has Birchenough become in the handling of the M.F. Later in the evening, when most of the visitors had left the aerodrome, a Hanriot monoplane was wheeled out and went for a short flight over the surrounding country. On landing things did not go quite smoothly, however, with the result that she stuck her tail up in the air in a most unseemly manner and, I believe, dislodged her pilot, who fortunately escaped uninjured. As surprisingly little damage was done to the machine, we may hope to see the Hanriot in the air again very shortly.

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Among the many great and far-reaching effects of the war one seems to be the disappearance of moustaches. Several of my friends have, since the outbreak of the war, discarded the Kaiserly adornment of their upper lip, and on Saturday I met, almost without recognising him, a well-known designer, whose name I do not propose to disclose, but whose products are characterised by back-swept crescent-shaped wings, who was looking quite cold minus that formerly well-cultivated adornment, a bristling *Schnurbart*.

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Mr. F. Warren Merriam's many friends will be pleased to hear that his appointment as civilian instructor to the Naval Flying School at Hendon has been confirmed. Mr. Merriam volunteered for active service, but the authorities have decided to employ his services in the manner mentioned above, and in view of his long and successful experience as an instructor at the various Bristol flying schools Merriam should be of just as great if not greater service to the country in this capacity as if he were in the fighting line. Although as a civilian his duties do not include it, Merriam goes through the usual drills with the sub-lieutenants at Hendon, as he is anxious to, as he puts it, "learn all there is to be learned." He informs me that several very fine machines will be in use by the Naval school down Hendon way, including a 70 h.p. Caudron biplane, an R.E. biplane, and Lieutenant Porte's 100 h.p. Deperdussin monoplane, so that we may look forward to some good and varied flying work shortly.

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Work is progressing apace on the new Caudron type biplane that Mr. Warren is building at Hendon. Assisted by a few enthusiastic helpers, Warren toils along merrily from early morn till late at night, and by the time these lines are in print the new 'bus will, with anything like luck, be in the air. Although the casual observer would probably find it difficult to distinguish it from an original Caudron, Warren has incorporated little constructional details of his own, notably as regards the steel clip work. The wing construction is also slightly different from that of the Caudron, especially the shape of the trailing portion of the wings, which has been shaped in such a manner as to provide a form of progressive springing. The workmanship is remarkably good, and when ready the machine should prove an exceptionally fine school 'bus, as the Caudrons are well known for the ease with which they are mastered, and the amount of rough usage that they will stand. As soon as this "firstborn" is finished another will be put through with all possible haste, as several pupils are waiting to join the Warren school.

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As recorded in Eddies some time ago, Mr. Beatty has been busy on the design of a new engine, which is now nearing completion. Evidently his reason for bringing out one of his own is not to be attributed to any dissatisfaction with the Gyro motor, as the other day I heard from him that the Gyro had recently done 16½ hours' running on the school 'buses without changing a wire or a plug. As to Beatty's new "power-plant," more of this next week.

"ÆOLUS."

"THE AEROPLANE OF TO-MORROW."

VARIABLE SURFACE, CAMBER AND INCIDENCE, AND THEIR EFFECT ON SUSTENTATION, SPEED AND SAFETY.

By L. DE BAZILLAC, Engineer, Ecole Superieure d'Aeronautique de Paris.

(*Continued from page* 926.)

Let α = the angle of attack measured from the fictitious plane.
K = a coefficient approximately constant, but, however, as much greater as K_y is greater for the same K_x.
a_1 = the angle corresponding to the minimum of the ratio $\frac{K_x}{K_y}$
t = a coefficient generally negative, variable with the camber.
r = a coefficient less than unity.
σ = a coefficient for the body and the planes and such that $\sigma = \frac{\lambda}{KS}$. One has in a first approximation, and in modifying the admitted formulæ in such a way that when $S = \infty$, $a_0 = a_1$

$$H - W \sin i = KSV^2 (ra^2 + ta + \sigma + ra_1^2)$$
$$W \cos i = KSV^2 a$$

This expression is not exact, since $V = \sqrt{\frac{W \cos i}{KSa}} + E$, where $E = f(a_1)$. This becomes zero where $S = \infty$ and $a_1 = 0$, but the error involved by neglecting E for all values of S is negligible, and has no appreciable effect upon the general problem, while it simplifies calculations. The preceding relations then give—

$$\frac{H}{W} - i = \theta - i = ra + t + \frac{\sigma + ra_1^2}{a}$$

$$Vi = \sqrt{\frac{W}{KSa}} \left(\theta - ra - t - \frac{\sigma + ra_1^2}{a} \right) \quad (1).$$

The derivative of this function becomes zero when

$$ra_m^2 + (\theta - t) a_m - 3 (\sigma + ra_1^2) = 0 \quad (2).$$

The positive angle corresponding to the maximum of (Vi), for a given surface, is then

$$a_m = \frac{1}{2r} \left[-(\theta - t) + \sqrt{(\theta - t)^2 + 12r \left(\frac{\lambda}{KS} + ra_1^2 \right)} \right]$$

If the camber increases with the angle of attack the sustaining quality increases. The greater S and K are, to the extent of the limiting surface, the quicker (Vi) increases, and the smaller will be a_m. When $S = \infty$, $a_m = a_1$. Excepting this limiting case, it is evident that a_m is greater than a_1, the angle of normal speed.

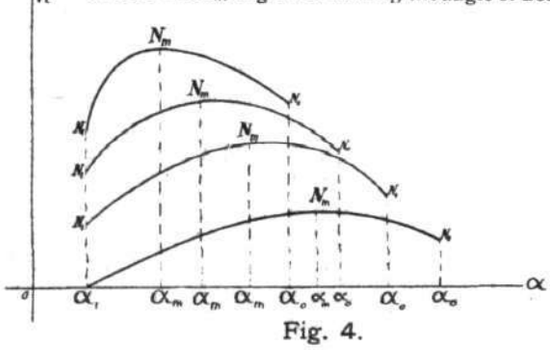

Fig. 4.

We shall show that a_m is always smaller than a_0, the angle corresponding to the minimum on the curve of inclinations.

When $a = a_1$, $(Vi) = o$ and the equation (1) gives $\theta = 2ra_1 + t + \frac{\sigma}{a_1}$. When $a = a_0$, θ is a minimum, its derivative becomes zero, and $\frac{\sigma}{r} = a_0^2 - a_1^2$.

Substituting these values in the equation (2) we have

$$a_m^2 + \left(a_1 + \frac{a_0^2}{a_1} \right) a_m - 3a_0^2 = 0. \quad (3).$$

We can readily see that the value of a_m, which satisfies this equation, is less than a_0. For the values of a_m equal to a_1 and to a_0 the function (3) passes from negative to positive. The positive value of a_m, which nullifies the function, is then necessarily included between a_1 and a_0.

The maximum value of the speed of ascent included between the angle of normal speed, a_1, and the angle, a_0, is, to the extent of the limiting surface, proportional to the inclination of the trajectory of climbing. Consequently, as much quicker as the gradient increases, so also does this maximum value. It corresponds then to smaller angles of attack. These circumstances still further increase the variations of the speed of ascent corresponding to the same variations of angles.

It is necessary to add to this that the ascending speed corresponding to the angle of attack, a_0, will be itself higher with a surface sufficiently large and rationally curved, and that this speed is very near to the maximum speed of ascent.

Accordingly by the equations (1) and (2), and by designating N_m the maximum value of the speed of ascent, a_m the corresponding angle of attack, N_0 the speed of ascent for the angle a_0 corresponding to the minimum of the curve of inclinations, we obtain—

$$N_m = \frac{2}{3} \sqrt{\frac{W}{KS}} \left[\frac{\theta - t}{\sqrt{a_m}} - 2r\sqrt{a_m} \right]$$

$$N_0 = \sqrt{\frac{W}{KS}} \left[\frac{\theta - t}{\sqrt{a_0}} - 2r\sqrt{a_0} \right] \left(\text{for then } \frac{\sigma}{r} = a_0^2 - a_1^2 \right)$$

These equations show that the maximum speed of ascent for a given surface differs appreciably from that corresponding to the angle a_0, by the difference between the two angles of attack a_0 and a_m only. For the attainable values of S this difference is small.

We have then, in the curve shown in Fig. 4, with the angles of attack as abscissæ, and the speeds of ascent as ordinates (the speed of ascent N_0 corresponding to $N_1 = 0$ being taken for unity), the form of the variations that take place, θ being equal for different augmentations of the surface, made at the angle of normal speed, by the speed of ascent, between the angle of normal speed a_1, and the angle a_0, the camber increasing with the angle of attack.

It is seen that a machine with a variable camber, and with a surface capable of attaining its maximum at the angle of normal speed, would keep an ascending speed near to its maximum value, through a much greater range of the angles of attack. This is increased by the fact that a_0 approaches a_1, with the increase of surface and camber.

This quality, together with the facility of climbing flight, high speed of ascent, and a certain reserve of sustentation, all obtained by means of a large increase of surface, and a rational camber, is certainly one of the best that a machine with a variable surface and camber can show. A large surface, rationally curved, in increasing the slope of climbing, increases still more the capacity of the machine to resist descending winds.

Variable speed, obtained by the variation of surface and camber,

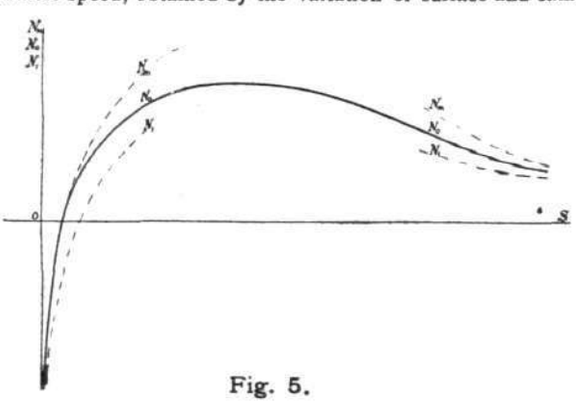

Fig. 5.

in ascending flight is thus not a figment of the imagination, but is seen to be a decisive criterion for the perfect aeroplane.

Note.—It can be shown that there exists for each angle of attack a determined surface which makes the product (Vi) a maximum, and to this end we will examine the variations of the speed of ascent N_0, for example, corresponding to a_0 as a function of S; in considering only, in order to curtail the calculations, the limiting case, where a_1 (the angle corresponding to the minimum value of the ratio $\frac{K_x}{K_y}$) would be zero, θ remaining always of finite magnitude, we have—

$$N_0 = \sqrt{\frac{W}{KS}} \left[\frac{\theta - t}{\sqrt{a_0}} - 2r\sqrt{a_0} \right]$$
$$= a_0^{\frac{1}{2}} \left(\frac{W}{KS} \right)^{\frac{1}{2}} \left(\frac{\theta - t}{a_0} - 2r \right)$$
$$= (\theta - t) \left(\frac{\lambda}{rKS} \right)^{\frac{1}{4}} \left(\frac{rW}{\lambda} \right)^{\frac{1}{2}} - 2r \left(\frac{\lambda}{rKS} \right)^{\frac{1}{4}} \left(\frac{W}{KS} \right)^{\frac{1}{2}}$$
$$= (\theta - t) \left[\left(\frac{\lambda}{Kr} \right)^{\frac{1}{2}} r \frac{W}{\lambda} \right]^{\frac{1}{2}} \frac{1}{S^{\frac{1}{4}}} - 2r \left[\left(\frac{\lambda}{Kr} \right)^{\frac{1}{2}} \frac{W}{K} \right]^{\frac{1}{2}} \frac{1}{S^{\frac{1}{4}}}$$

The variations of K being relatively small, and of negligible magnitude compared with S, let us suppose K to be constant

Then—

$$(\theta - t)\left[\left(\frac{\lambda}{Kr}\right)^{\frac{1}{2}}\frac{rW}{\lambda}\right]^{\frac{1}{2}} = A \text{ and } r\left[\left(\frac{\lambda}{Kr}\right)^{\frac{1}{2}}\frac{W}{K}\right]^{\frac{1}{2}} = B$$

$$N_0 = \frac{A}{S^{\frac{1}{2}}} - \frac{2B}{S^2} = \frac{AS^{\frac{1}{2}} - 2B}{S^2}$$

$$= \frac{1}{S^2}\cdot(AS^{\frac{1}{2}} - 2B) = \frac{(AS^{\frac{1}{2}} - 2B)\ (AS^{\frac{1}{2}} + 2B)}{S^2\ (AS^{\frac{1}{2}} + 2B)}$$

$$= \frac{A^2S - 4B^2}{AS^{\frac{3}{2}} + 2BS^2} = \frac{A^2}{AS^{\frac{1}{2}} + \frac{2B}{S^{\frac{1}{2}}}} - \frac{4B^2}{AS^{\frac{3}{2}} + 2BS^2}$$

The derivative of this function is—

$$N_0' = \frac{3B}{2}\cdot\frac{1}{S^2} - \frac{A}{4}\cdot\frac{1}{S^{\frac{1}{2}}} = \frac{\frac{3B}{2} - \frac{A}{4}S^{\frac{1}{2}}}{S^2}$$

$$= \frac{1}{S^2}\left(\frac{3B}{2} - \frac{A}{4}S^{\frac{1}{2}}\right) = \frac{\left(\frac{3B}{2} - \frac{A}{4}S^{\frac{1}{2}}\right)\left(\frac{3B}{2} + \frac{A}{4}S^{\frac{1}{2}}\right)}{S^2\left(\frac{3B}{2} + \frac{A}{4}S^{\frac{1}{2}}\right)}$$

$$= \frac{\frac{9B^2}{4} - \frac{A^2S}{16}}{\frac{3B}{2}S^{\frac{3}{2}} + \frac{A}{4}S^2} = \frac{\frac{9B^2}{4}}{\frac{3B}{2}S^{\frac{3}{2}} + \frac{A}{4}S^2} - \frac{\frac{A^2}{16}}{\frac{3B}{2}S^{\frac{3}{2}} + \frac{A}{4}S^2}$$

The curve shown in Fig 5 then shows the variation in the value of N_0 plotted as a function of S. This curve shows that in the particular case where α_1 would be zero, and for a surface

$$S = 9 \times \frac{4B^2}{A^2} = 9 \times \frac{4r\lambda}{K(\theta - t)^2},$$

one has, at the angle of attack α_0, the highest speed of ascent. This speed becomes zero in the general case, when $S = \frac{4r\lambda}{K[(\theta - t)^2 - 4r^2\alpha_1^2]}$, and when $S = \infty$.

In the same way it will be found that the maximum speed of ascent N_m corresponding to the angle α_m passes through a maximum and becomes zero, when $S = \infty$ and when $S = \frac{4r\lambda}{K[(\theta - t)^2 - 4r^2\alpha_1^2]}$ in the general case; and for this value

$$N_m = N_0 = 0;\ \alpha_0 = \alpha_m = \frac{\theta - t}{2r}.$$ (See Fig. 6).

It would suffice to study the variations of N_m as a function of α_0, α_m, α_1; one sees, besides, that the derivative of N_m approaches zero by negative values, and approaches infinity by positive values when S approaches infinity, and when S approaches zero; also, that when $S = \infty$, $\alpha_0 = \alpha_m = \alpha_1$; $N_m = N_0 = N_1 = 0$.

The speed of ascent N_1, which corresponds to the angle of normal speed α_1, becomes zero when $S = \infty$ and when

$$S = \frac{\lambda}{K\alpha_1[(\theta - t) - 2r\alpha_1]}.$$

This value is greater than that of S for which N_m and N_0 are zero. Thus it defines the lowest limit of the surface, whilst the highest limit is determined by the value of S for which N_m becomes a maximum.

We have supposed the propeller thrust to be constant. In reality, for great decreases in speed, *i.e.*, for variations of the surface from its lowest limit to infinity, the thrust increases, and, consequently, the slope of ascent i; but the error in this value does not alter the general form of the results, and remains inappreciable for the attainable values of S, or included within its permissible limits.

It can also be proved that the general form of the curve of inclination is independent of the approximation admitted for the laws of the resistance of the air. The results which we have just attained are, therefore, true in every case.

(To be continued.)

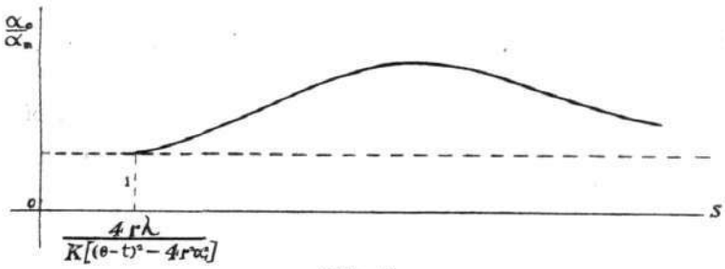

Fig. 6.

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FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

Naval Flying.—There was very little flying last week owing to the windy weather. The following machines were out:—1, 2, 63 Short's, Flight-Lieut. McClean's Short, all being used for instructional purposes for young officers.

Civilian Flying.—Mr. Alec Ogilvie made a couple of fine flights on his Wright 35 h.p.

Brighton-Shoreham Aerodrome.

Pashley Bros. and Hale School.—Instructors for last week: C. L. Pashley. Up with instructor:—Mrs. Joseph, Mrs. Vincent, W. Cole. Circuits and eights:—J. Woodhouse, C. Winchester, C. Butler, Mrs. Vincent. C. Butler passed the certificate tests with the usual good style.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday last week, straights with instructor:—Messrs. Carabajal, Duncan, and Morgan, Lieuts. Giles, Haines, and Riggall. Solo straights:—Mr. Mumby. Solo circuits:—Mr. Crowe.

Wednesday, straights with instructor:—Messrs. Carabajal, Duncan, Easter, and Lieuts. Allen, Riggall, Strong, Giles, Haines, Solo straights:—Mr. Strickland, Lieut. Strong. Solo circuits:—Mr. Crowe, Lieuts. Vere and Whitehead.

Thursday, straights with instructor:—Messrs. Morgan, Polehampton, Carabajal, Duncan, Morgan, and Stalker, Lieuts. Perry, Riggall, Allen, Giles, Haines, Rosher, and Strong. Straights alone:—Messrs. Mumby and Strickland, Lieut. Strong. Circuits and eights:—Mr. Crowe, Lieuts. Vere and Whitehead.

Friday, straights with instructor:—Mr. Carabajal.

Instructors for the week:—Messrs. Manton, Merriam, Russell, Shepherd, and Winter.

Beatty School.—Monday, last week, Messrs. Cheung 32, Roche Kelly 15, Virgilio 15, Lord 15, and Parker 15.

Tuesday, Messrs. Smith 15, and Lord 15.

Wednesday, Messrs. W. E. de B. Whittaker 15, Virgilio 15, Hornby 15, Gardner 15, Whitehead 5, and Lieut. Rimington 15.

Thursday, Messrs. Parker 15, and Whitehead 5.

End of week no flying owing to bad weather.

Mr. Andrew Cheung took his Certificate at beginning of week in very good style.

Hall School.—During the course of last week Instructor Clappen has been out several times flying on Caudron No. 2, and E. Brynildsen out for practice made several good straights, greatly improving in getting direction with tail well up.

In the workshops the mechanics are busily overhauling the *brevet* biplane, re-covering the wings and re-wiring throughout. The 'bus is expected to be completed in a week's time. In the meantime practice will continue on the other available machines, and No. 2 Caudron has been fitted with a more powerful motor and is taking the place of the *brevet* biplane *pro tem.*

Models

Edited by V. E. JOHNSON, M.A.

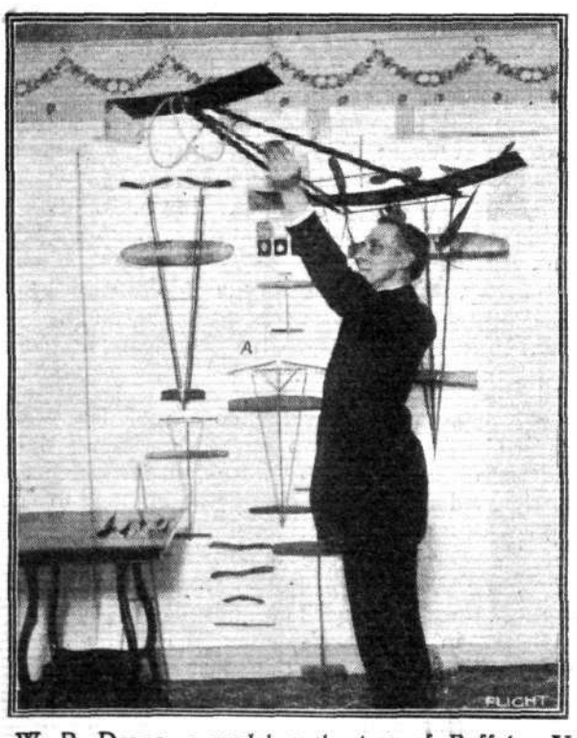
Mr. P. L. Senecal's Models.

WRITING with respect to our comments on his communication published on August 7th under the title "Has the Modern Model been Anticipated?" Mr. L. Senecal says: "I notice in your comment on my letter concerning my father's model in FLIGHT, August 7th, that the *distance*, 700 yards, is questioned. Since then I have roughly calculated by the formula given in FLIGHT of 1912, the pitch of the screws and the distance they would draw the machine. I find that the pitch of a screw of 13 in. diameter at 45° is 41·76 ins., reckoning 500 turns to each (this is the number my father says he used to use), the total distance the model would fly unaided by the wind is 1,160 yards. [Not so, 580 yards approx. only, since both propellers revolve simultaneously.—V.E.J.] Deducting 25 per cent. of this for friction, &c., the remainder is 870 yards. [Really 435 yards.—V.E.J.] In face of this I see no reason why the machine should not have flown 700 yds.

"It is a difficult matter to prove, since no records of the model were taken. The existence of the model can be proved by the catalogue of the Workman's Exhibition of 1879, which I have in my possession. I have also the fellow model which was exhibited with the aeroplane. It is catalogued the 'Angiroptone,' which is a travelling helicopter and intended to rise and travel by rotation. This machine is intact even to the rubber on it. I have also a replica of it and the series of the smaller machines which led to the construction of the 'Angiroptone.' If you think that a description, dimensions, &c., of this model would be interesting to any of your readers, I will send them."

We shall be very pleased to receive particulars and drawings. Any old model work of this date has an especial value, for at this period it was in Great Britain that the most important work was being done; much has undoubtedly been lost, but every means should be taken to recover all that we can.

With regard to the theoretical distance that a model should travel and what it actually accomplishes in practice a very great discrepancy exists. We have known of some models whose theoretical distance was over a mile, and which have never accomplished half that distance. On the other hand, there have been models which have actually exceeded this distance even in, what one might call, calm air. We shall be pleased to receive some particulars from long-distance fliers bearing on this interesting point, in order that one might form some kind of *average* ratio, which probably exists between the theoretical length of flight and that actually accomplished in calm air, or in cases where due allowance has been made for wind velocity.



Mr. W. P. Deane, a model enthusiast of Buffalo, N.Y., and some of his models.

Stony Stratford and District Model Aeroplane Club.

We have received the following communication from Mr. O. Hamilton, jun., the hon. sec. of the above club, with respect to a new competition rule or formula, which is based on known flying performances of the most regular machines in use, *i.e.*, twin-screw and single-screw hand-launched models, and which has resulted, it is considered, in improving the general flying.

The introducer, Mr. Mennell, carefully calculated the ft. per sec. of a number of test flights, competition flights and record flights and found that the average speed came out at 20 ft. per sec. and he then introduced the mark basis of 1 mark for each 20 ft. and 1 mark for each sec. duration. This equalises the chances for both the fast or slow machine; for what one gains in distance one loses in time if the speed be high and *vice versâ* if slow. We find that it has developed the machines for more all-round flying. In the case of the r.o.g. machines we are checking figures to ascertain whether they will requre a new mark basis, but it was decided to allow 20 per cent. on tractor models in h.l. classes, but no statement was entered in the minutes *re* r.o.g. models.

To quote a few examples:—

	1st	Members' Comp.	Dec. 27, '13	Best distance, 131 yds. 1 ft.
x	2nd	,,	Jan. 15, '14	,, 178 yds. 1 ft.
	3rd*	,,	Feb. 21, '14	,, 150 yds. (flight only).
	4th	—	Mar. 28, '14	Best duration, 40 secs.
	5th	—	Apr. 18, '14	,, 35½ secs.
	6th	Members' Comp.	May 16, '14	Best distance, 273 yds.
	7th	,,	June 20, '14	,, 339 yds. 2 ft.
		Special Competition	June 27, '14	Duration, 58½ secs.
zx	8th	—	July 25, '14	Duration, 46·2 secs; distance, 255 yds.
	9th	—	Aug. 15, '14	Distance, 480 yds. 2 ft.; duration, 62·2 secs.

* Very wet.

x means average results started in competitions.

zx means new competition rule first time.

You will notice a sharp drop in the distance figures, but better duration figures in the first competition under the rule; the next one shows a better distance and duration. This makes us feel we are on the road to the best all-round model.

We are running the secretary's medal on this basis for the best performance of the year, but we have excluded the twin h.l. but not the single h.l., and its inclusion in the list of types eligible has improved its capabilities, *i.e.*, the last sheet (August 22nd) shows a flight of 50 secs. and 377 yards; we are so enthusiastic about the possibilities of the single h.l. that we have drafted a resolution to the K. and M.A.A. on the topic: the draft of the resolution is as follows: "That the members of this club are of the opinion that to encourage straight flights by single-screw hand-launched models, distance should be recognised in the record performances; the members think such a recognition would develop the interests of model aviation."

Some Remarks on Model Gliders and One-Ounce Models by B. W. L. Fisher Hussy.

It appears to me that at the present time there are two classes of models which seem to be absolutely non-existent. The first is the model glider. Some years ago, when the model maker was regarded as a madman and the flying stick was the prevalent type of model, the Arundel House School Aero Club of Surbiton organised and held a very successful competition for this type of model, the winning flight being I believe about 150 ft. in length; since then nothing has been heard of this type of model. In the early part of 1909 I myself constructed a very successful model glider on "Dunne" lines with various modifications of my own (such as a tail, &c.). With this model I achieved glides varying from 30 to 80 yards in distance from the height of about 6 ft. All these glides were made in the evening. It is true that this branch of model aeroplaning can only be practised in fairly calm weather, but nevertheless immense pleasure can be obtained in watching a model, possessing no motive power whatsoever, gliding slowly and steadily through the air. The model was, as far as I can remember, made

of 20 s.w.g. piano wire and surfaced with tracing paper; it had a backbone of a piece of birch 12 × $\frac{5}{16}$ × $\frac{1}{4}$ ins. and carried a lead weight weighing $\frac{3}{4}$ ounce. The span of the model was about 26 ins. and the chord 4 ins. These measurements are speaking from memory except as regards the weight, which I recorded in a book wherein I record all flights made by my models. I continued experiments with this type of model up till the end of 1910, when pressure of work forced me to give up model-flying altogether. Of course one must not forget the invaluable gliding experiments of Mr. José Weiss in, I believe, Sussex.

The second type of model is the "one ounce" type. In 1909 a sweepstake was organised for this type of model, and the results were excellent, some making flights of up to 250 yards in rather inclement weather. The models flown in this competition were made by such well-known gentlemen as Messrs. T. W. K. Clarke, W. G. Aston, G. P. Bragg-Smith, H. Burge-Webb, &c., &c. Mr. Bragg-Smith's model, in particular, although not flying as far as some of the faster monoplanes, made a duration of, I believe, 25 to 30 secs. Mr. T. W. K. Clarke put his model on the market with, I believe, a good result, and I believe I am right in saying still sells them. A great number of these models, including Mr. Bragg-Smith's and Mr. Clarke's, were single-propeller models, while the rest were double-ended and twin-propeller models. I myself achieved a fair amount of success with this type, and as soon as I have the time to devote to model flying intend to do so again.

Of course, this type of model does not lend itself to experiments in which designs applicable to full-size machines can be made, but, nevertheless, an excellent adjustment of plane area, camber, and weight distribution must be arrived at to get them to fly successfully.

Could not a prize be put up for a competition for models, say, of a given span and length, the length not to exceed the span and the weight not to exceed, say, 2 ozs.? Also, could not a competition be arranged for model gliders? In this type of model experiments with designs applicable to full-sized machines could most certainly be made?

[In the back numbers of FLIGHT very considerable space and attention has been devoted to model gliders, and there are undoubtedly even at the present time a considerable number of experiments still being made with them. With respect to a model glider competition, the subject is one which has on several occasions been brought up at Council meetings of the K. and M.A.A., but it has never met with anything like general favour. Personally the writer has always held the opinion that very instructive and interesting experiments might be made with large models of not less than 6 to 8 or 10 ft. span, released from kites flown at varying altitudes. With regard to 1 or 2 oz. models, I sincerely trust they are dead for ever.—V.E.J.]

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration ...	J. E. Louch	...	95 secs.
Twin screw, do.	Distance ...	R. Lucas ...	...	590 yards.
	Duration ...	G. Hayden	...	137 secs.
Single screw, rise off ground	Distance ...	W. E. Evans	...	290 yards.
	Duration ...	J. E. Louch	...	68 secs.
Twin screw, do.	Distance ...	L. H. Slatter	...	365 yards.
	Duration ...	J. E. Louch	...	2 mins. 49 secs.
Single-tractor screw, hand-launched	Distance ...	C. C. Dutton	...	266 yards.
	Duration ...	J. E. Louch	...	91 secs.
Do., off-ground	Distance ...	C. C. Dutton	...	190 yards.
	Duration ...	J. E. Louch	...	94 secs.
Single screw hydro., off-water	Duration ...	L. H. Slatter	...	35 secs.
Single-tractor, do., do. ...	Duration ...	C. C. Dutton	...	29 secs.
Twin screw, do., do. ...	Duration ...	S. C. Hersom	...	65 secs.
Engine driven off grass ...	Duration ...	D. Stanger	...	51 secs.

The War.—On account of the present serious position and as the president is engaged organising a regiment in the North and the vice-presidents and the gen. hon. sec. are on active service, it has been decided that during the war all competitions shall be postponed except those already fixed, viz., the Association's Cup, the Clarke Contest and the Weston Contest.

The second annual competition for the Michelin Challenge Trophy for a team of three kites took place on Wimbledon Common on Saturday, Sept. 5th. The kites were judged upon vertical lifting capabilities per unit area of material of the kite, stability of flight, strength of construction and portability. The winner of the trophy was W. A. Collins with H. J. Bellsham a very close second. The following gives details of the respective value of these two teams:—1. W. A. Collins, three box and wing; net area in sq. ft., 97·8; maximum lift in lbs., 38; marks awarded, lift, 39; stability, 100; strength, 52·5; portability, 50; total, 241·5. 2. H. J. Bellsham, two Broo type, one scout type; net area in sq. ft., 98·1; maximum lift in lbs., 42; marks awarded, lift, 43; stability, 100; strength, 45; portability, 50; total, 238. W. A. Collins therefore holds the trophy for one year from the date of prize distribution and wins a silver medal of the association, and H. J. Bellsham wins a silver medal of the association.

Notices.—In future the model hon. sec., Mr. H. A. Lyche, will publish all notices necessary as regards models and Mr. G. T. White with regard to kites.

Wireless Section.—The gen. hon. sec., Mr. Akehurst, although on active service, is still endeavouring to get an outfit for the section, and Lord Kitchener has stated that he will be pleased for him to interview the Director of Fortifications, as regards the details, &c., so that any patriot interested should advise the gen. hon. sec., W. H. Akehurst, at 27, Victory Road, Wimbledon, to whom all letters on the subject will be forwarded and arrangements made to see the Government officials.

27, Victory Road, Wimbledon. W. H. AKEHURST, Gen. Hon. Sec.

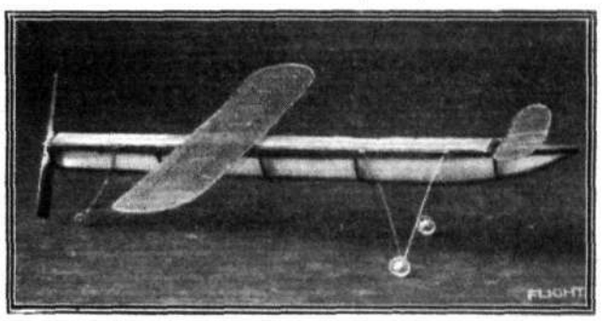
Mr. P. W. Peel's Model with Covered-in *Fuselage*.

The accompanying photograph gives an excellent general idea of this model, a monoplane of the canard type, fitted with a covered-in *fuselage* and single propeller.

Weight.—The total weight of the model is 9 ozs., made up as follows: Carved propeller, 11 ins. in diam., $\frac{1}{4}$ oz.; gearing, two 1-in. gears, $\frac{1}{2}$ oz.; *fuselage*, 2·5 ozs.; rubber, 2 ozs.; wing, 2 ozs.; elevator, front chassis and rear skid, 2 ozs.

Fuselage.—This is triangular, 33 ins. long, the widest part of the body on the top and sides is 3 ins., and the narrowest 2·5 ins. Five distance pieces on the top and each side separate the longitudinals. The top of the *fuselage* is detachable from the first distance piece, to allow perfect inspection of the rubber.

Main Plane.—Shape elliptical, constructed of 18 s.w.g., span 36 ins., chord 6 ins., attached to the *fuselage* on two 18 s.w.g.



Mr. P. W. Peel's covered-in *fuselage* monoplane, canard type.

mountings raised ·25 ins. above the *fuselage*. The planes are fixed on by means of rubber bands.

Elevator.—Shape elliptical, span 11 ins., chord 3 ins., constructed of 18 s.w.g.

Chassis.—Of 18 s.w.g., two vee-type mountings for disc wheels, depth of chassis 8 ins., situated 8 ins. from the nose of the *fuselage*.

Motive Power.—Two skeins of $\frac{1}{4}$ inch strip rubber, 8 strands each, 30 ins. long.

Centre of Gravity.—Situated 1 in. in front of the leading edge of the main plane.

AFFILIATED MODEL CLUBS DIARY.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Ae.C. (14, LEYTONSTONE RD., STRATFORD)

SEPT. 13TH, Competition B. Section for models of any kind, best single flight, at Wanstead Flats Ground, Forest Gate. Please note that now the winter season has commenced flying takes place from 10 to 12.45.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

SEPT. 12TH, handicap for Farrow Shield models, three prizes.

UNAFFILIATED CLUBS.

S. Eastern Model Ae.C. (154, PECKHAM RYE, S.E.).

SEPT. 13TH, Blackheath, 7.10 a.m.; Lee Aerodrome, 10.30-12. South-Eastern Trophy Competition, Sept. 27th. Members are requested to push on with models intended for this competition, and should note that Rule 4, which reads "The model, with the exception of wheels and propeller, must be of competitor's own construction," has been suspended. Entry forms can now be obtained from the hon. sec.

CORRESPONDENCE.

Steering Aircraft at Sea—Establishing an Artificial Horizon.

[1885] Referring to your interesting article in last week's issue, there is one point to which I would like to refer—viz. the use of an artificial horizon—when the natural horizon is obscured. As long ago as 1744 an effort was made to assist navigation in this direction by the use of a spinning top with a highly polished upper surface, to give an artificial horizon when the natural one was hidden by cloud or fog. The inventor, Sarson by name, was sent out by the Admiralty to put his invention to a practical test and was unfortunately lost in the wreck of the Victory. The idea was ingenious but crude, and no use of it appears to have been made in England, but it has been in use more or less ever since, in a more and more improved form, amongst other nations, especially the French.

The Frenchman Fleuriais was the first to show how to establish an artificial horizon by means of a gyroscope; he employed the precessional movements of a barogyroscope (bottom heavy gyroscope)

in such a manner that with the highest and lowest position of this movement the sextant's observation could be arrived at. The mean of these observations was considered as being the correct value for the zenith. These gyroscope sextants have more recently undergone a further development, see Patent No. 4555 of 1902; Pouthers and Therrode's Patent. Still later Narzisz Ach Patent No. 16,996 of 1908 claims further advancement. The gyroscope employed in this method is distinguished from similar arrangements in that it can be centred. Moreover, it does not show any precessional movements in the time necessary for observation. However, a gyroscope provided with two or three adjustable degrees of freedom cannot be used as an artificial horizon, as the angle which the gyroscope forms with the surface for the horizontal is not known.

Moreover, a continual control of the deviation of the surface of the gyroscope from the mathematical horizontal is essential, and this error of deviation must be a minimum. The last-named patent has for its aim the accomplishment of these objects.

The establishment of the artificial horizon by such a method as the above, would far surpass in accuracy any of the methods suggested, more especially when applied to an aeroplane, or so at least it appears to me.

V. E. JOHNSON.

Bombs for Zeppelins.

[1886] Would not a cheaper and more effective method of destroying Zeppelins be to introduce into ballonets a gas which, combined with hydrogen, would be highly explosive? This could be managed by dropping, instead of bombs or shrapnel, a pointed iron vessel, with a high-pressure valve and containing very highly compressed chlorine, almost in the liquid state. On entering the gas-bag the relatively small pressure of the hydrogen in comparison to the high pressure of the chlorine would cause the chlorine to rush out by the pressure valve on the projectile. The dim light which would enter through the semi-transparent covering of the airship would in nine cases out of ten be sufficient to cause an explosion more violent than if caused by bomb; and in case of not exploding the hydrochloric acid gas resulting would be so much heavier than hydrogen that after several of the ballonets had been pierced by "chlorine-bombs" the airship would surely have lost its buoyancy.

These "chlorine-bombs" could be dropped from a hostile aeroplane or airship, and on account of their lightness and cheapness could be used far more extensively.

I should like to hear the opinion of your readers on the likelihood of the practical success or failure of such a method.

H. S. CUTHBERTSON.

Finchingfield, Essex.

THE WAR AND "MADE IN GERMANY" TRADE.

IN view of the reports which have been circulated regarding the British Petroleum Co., Ltd., the Secretary, Mr. Charles Bourke, has been authorised and instructed by the Directors to make the following statement for the purpose of reassuring their customers and employees :—

(1) The Company is a British Company and was registered in England in 1906.

(2) The primary object for which the Company was formed was the sale and distribution of petroleum and its products in the United Kingdom.

(3) On the 4th August the Board consisted of six members, two of whom were Germans. The two German Directors ceased to be members of the Board immediately after the outbreak of hostilities between this country and Germany, and the Board now consists of three members, viz. :—

Consul-General H. Olsen of Christiania, who represents and is closely connected with the great Russian oil-producing firm of Nobel Brothers of St. Petersburg.

Mr. Isidore Braun of Paris, a Frenchman.

Mr. T. R. Kean of London, an Englishman.

(4) The officials of the Company, including its General Manager, are and always have been British ever since its formation. The whole of the Company's employees, numbering about 3,000, are entirely British (with one exception—a Russian) and about 150 of these are now serving with the British Forces.

(5) The British Petroleum Company forms part of a Union called the European Petroleum Union, which was formed in 1906 and registered in Bremen, but which is an international concern, one-half of its capital being held by Belgian and Russian Companies (including the Nobel Bros. Petroleum Company of St. Petersburg). At the time of the formation of the European Petroleum Union arrangements were made to prevent it falling under German control, and in fact it has never been under German control.

(6) No payments of any kind have been made by this Company since the outbreak of the war or will be made during its continuance, directly or indirectly, to the European Petroleum Union or to any party either in this country or elsewhere, for or on their behalf. Further, since the outbreak of war no communication of any kind has taken place with the officials of the European Petroleum Union either directly or indirectly.

(7) The full facts relating to the British Petroleum Company have been placed before the Government Departments concerned.

It is to be hoped that this statement of the Company's position will make it clear to all that it is a British and not a German concern.

PUBLICATIONS RECEIVED.

All the World's Aircraft. (*Aeroplanes and Dirigibles.*) Flying Annual by Fred T. Jane. Sampson Low, Marston, and Co., Ltd., 100, Southwark Street, S.E.

Sea, Land, and Air Strategy. By Sir George Aston, K.C.B., A.D.C. London: John Murray. Price 10*s.* 6*d.* net.

The Essays of an Aviator. London: *Aeronautics*, 170, Fleet Street, E.C.

IMPORTS AND EXPORTS, 1913-1914.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see FLIGHT, January 25th, 1912, and for 1912 and 1913, see FLIGHT for January 17th, 1914 :—

	Imports.		Exports.		Re-Exportation.	
	1913.	1914.	1913.	1914.	1913.	1914.
	£	£	£	£	£	£
January	12,097	5,945	4,005	210	1,510	879
February	17,361	28,132	3,447	106	690	441
March ...	20,425	27,731	1,924	1,934	1,042	1,440
April ...	15,593	11,384	5,524	1,175	1,413	1,473
May ...	31,241	17,062	3,726	4,059	830	9,484
June ...	14,905	15,967	1,408	5,082	1,106	142
July ...	14,469	15,548	3,812	4,994	1,250	1,695
Aug. ...	17,993	52,448	2,805	630	510	910
	164,084	172,217	26,651	18,190	8,351	16,464

Aeronautical Patents Published.

Applied for in 1913.

Published August 27th, 1914.

23,471. A. BEURRIER AND E. J. BIGOURDAN. Aerial vehicles.
24,433. A. E., H. L. AND H. O. SHORT. Floating docks for hydro-aeroplanes.

Published September 3rd, 1914.

18,251. SPRENGSTOFF A.-G. CARBONIT. Determining speed of aircraft and launching projectiles therefrom.
22,370. A. RYAN. Envelopes, balloons, gas-bags, &c., for airships.

Published September 10th, 1914.

18,476. W. H. NOSWORTHY AND S. J. PRESCOTT. Waterplane floats.
19,059. L. WIRTZ. Safety devices for flying-machines.
19,062. I. BELL. Flying-machines.
22,065. L. LIAIS. Fabrics for balloon envelopes.
27,074. R. BLACKBURN. Float chassis of hydroplanes.

Applied for in 1914.

Published August 27th, 1914.

3,207. H. T. WRIGHT. Aerial propellers.
15,452. E. DUEBALL AND W. HEILEMANN. Aeroplanes.

Published September 10th, 1914.

7,196. M. E. CLARK. Aeroplanes.
13,765. A. TEBALDI. Aeroplanes.

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